Fast Ethernet
GigaFrame Switch Family

XM59x

INSTALLATION AND USER GUIDE

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INTRODUCTION

The NBase XM59x is a family of high-performance switching cards for GigaFrame™, a board in the GigaHUB™ System which functions as a 10/100Base-X switch. ASIC technology assures superior performance and greater reliability, while the cards' flexibility enables them to be deployed at both the departmental and enterprise levels. When combined with enhanced media and protocol support, these features make the XM59x the obvious choice for fully-integrated Fast Ethernet networks.

Description

The XM59x family, comprising the XM594, XM596, XM598 and XM599 switching cards, features a maximum configuration of eight dual-speed 10/100 Mbps ports and up to two high-speed expansion slots. These slots are for the EM590/1/2/3 plug-in modules which provide capability for FDDI, InterSwitch VLAN, ATM and Gigabit Ethernet uplinks, or serve as two additional 10/100Base TX/FX ports. Each port on the XM59x can be configured for Full Duplex operation for supporting high-end workstations: up to 200Mbps point-to-point connections over standard Fast Ethernet cabling or fiber are possible. In addition, the F/O cards support flow control over Full Duplex links, for incomparable quality of service .

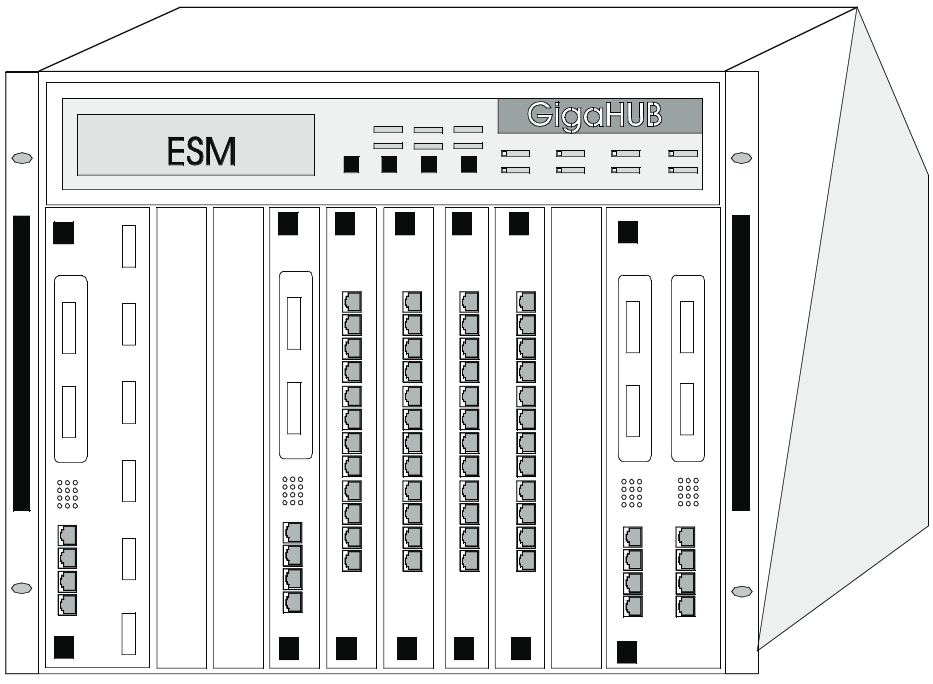


Figure 1: General View XM59x Family in GigaHUB System

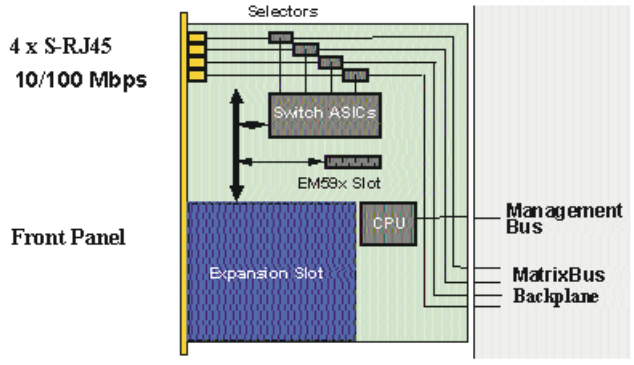
Features

Versatility	Up to eight 10Base-T ports and two expansion slots, or four 10Base-T/100Base-TX and six 100Base-FX ports
High-Speed Connectivity	Up to two high-speed network interface slots for two 100Base-TX and two 100Base-FX modules,or ATM and Gigabit uplinks
Architecture	Parallel store-and-forward, with direct source-to-destination port transfer
Reliability	Selective flow control, selectable on each port, prevents packet loss on both Half and Full Duplex ports
Transmission	Up to 110 km with singlemode 100Base-FX ports
Management	SNMP, Spanning Tree and RMON (Group 1-3, 9)
Duplex Mode	Half/Full Duplex selectable on each port
Address Table	Up to 4096 address cache entries
Security	Extensive custom filtering table, VLAN support
Configuration	Downloadable management system software (TFTP) or ESM (serial or TFTP)
Telnet	Provides remote access to Administrative Interface

The XM59x Family of 10/100/1000 Mbps Switches

XM594

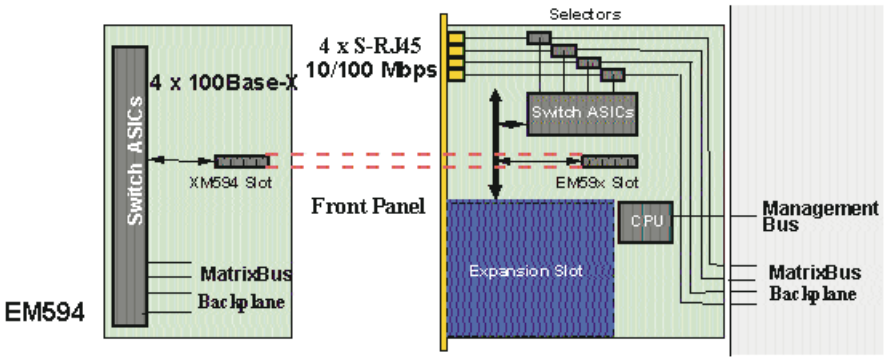
This is the basic card consisting of four steerable, auto-negotiable 100Base-TX ports and one expansion slot. The module allows connection of two additional 100Base-X ports or one high-speed uplink, ATM or Gigabit.



XM594 Block Diagram

XM596

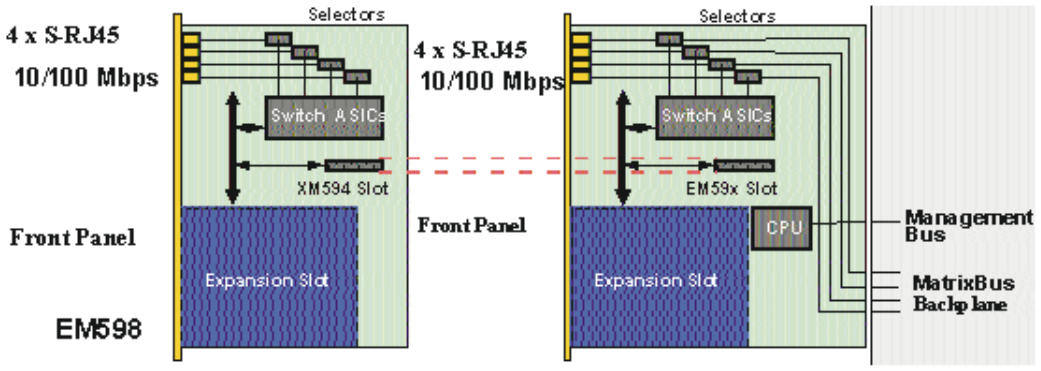
This card consists of the basic **XM594** plus one field-upgradeable plug-in module. The module, **EM594,** provides four additional 100Base-TX ports through a backplane connection only. Together, the cards occupy one GigaHUB™ slot and offer eight 100Base ports and one slot for high-speed expansion.



XM596 Block Diagram

XM598

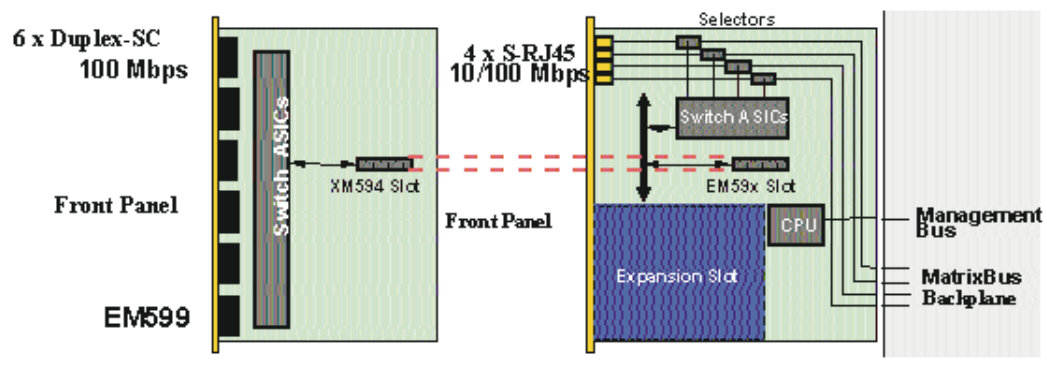
Occupying two GigaHUB™ slots, this card offers eight 100Base-TX steerable, auto-negotiable ports and two slots for high-speed expansion.



XM598 Block Diagram

XM599

This card occupies two GigaHUB™ slots and consists of four 100Base-TX and six 100Base-FX ports, as well as an expansion slot.

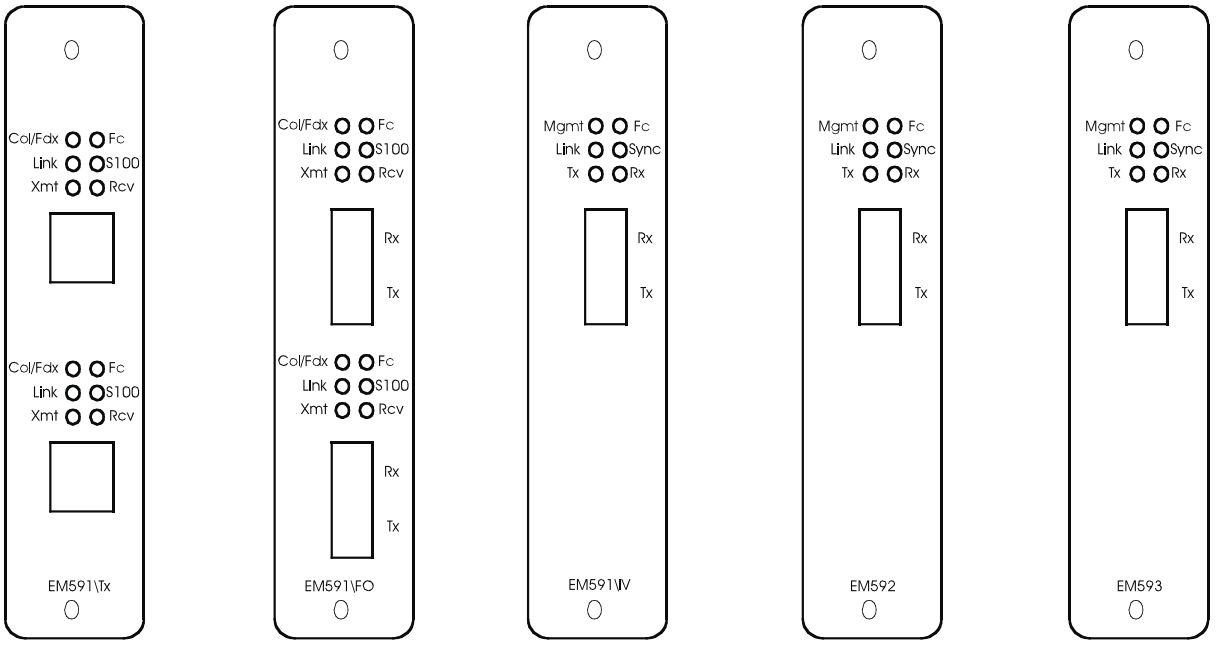


XM599 Block Diagram

Uplinks

The following uplinks, supported by the XM59x high-speed interface slots, serve various application requirements.

EM591/TX	Two 100Base-TX ports (auto-negotiation); flow control and full duplex support
EM591/FO	Two 100Base-FX ports; extends Fast Ethernet networks to over 100 km link distance with a 200 Mbps backbone.
EM591/IV	Adds InterSwitch VLAN capabilities implemented as a single, 100Base-FX port; ideal for configuring secure workgroups across multiple switches
EM592	Provides one 155Mbps ATM port for interlinking Ethernet LANs over an ATM corporate backbone. (LAN Emulation Client)
EM593	Provides a single port of Gigabit Ethernet connectivity, allowing for super fast 1 Gbps backbones.



Understanding the Backplane Connections

The XM59x switch operates in the MatrixBus topology of the GigaHUB platform. By allowing the backplane connection of other GigaHUB cards, the XM59x streamlines a company's network, eliminating the need for superfluous stand-alone units. The XM59x serves as a concentrator switch, while all other cards are "Diagonal Pin" connections, configured through ESM. The following cards can be connected to the XM59x through the MatrixBus backplane:

XM53x 10Base-T switch with Fast Ethernet and FDDI connectivity; must be HW Revision 7.0 or higher. Connection to a concentrator XM59x card requires an EM537S module.

XM542 16-port 10Mbps switch with Fast Ethernet connectivity, in both Half and Full Duplex; connection is via the internal Fast Ethernet port of the card (see XM542 User Guide).

LC372 12-port Fast Ethernet repeater card; see LC372 User Guide for connection specifications.

XM59x All other members of the XM59x family.

Diagonal Pin attachment connects a card via the MatrixBus of the slot in which the card resides. For example, a card located in Slot 2 will connect via MatrixBus 2 to Port 2 of the concentrator card. XM59x cards use port #1 for the MatrixBus connections to the concentrator switch.

An XM59x concentrator switch enables up to ten backplane connections. For maximum backplane utilization, the switch must be installed in slots 11-12. The combination of backplane connections depends upon the total Power Consumption of the installed cards. (See **Technical Specifications**)

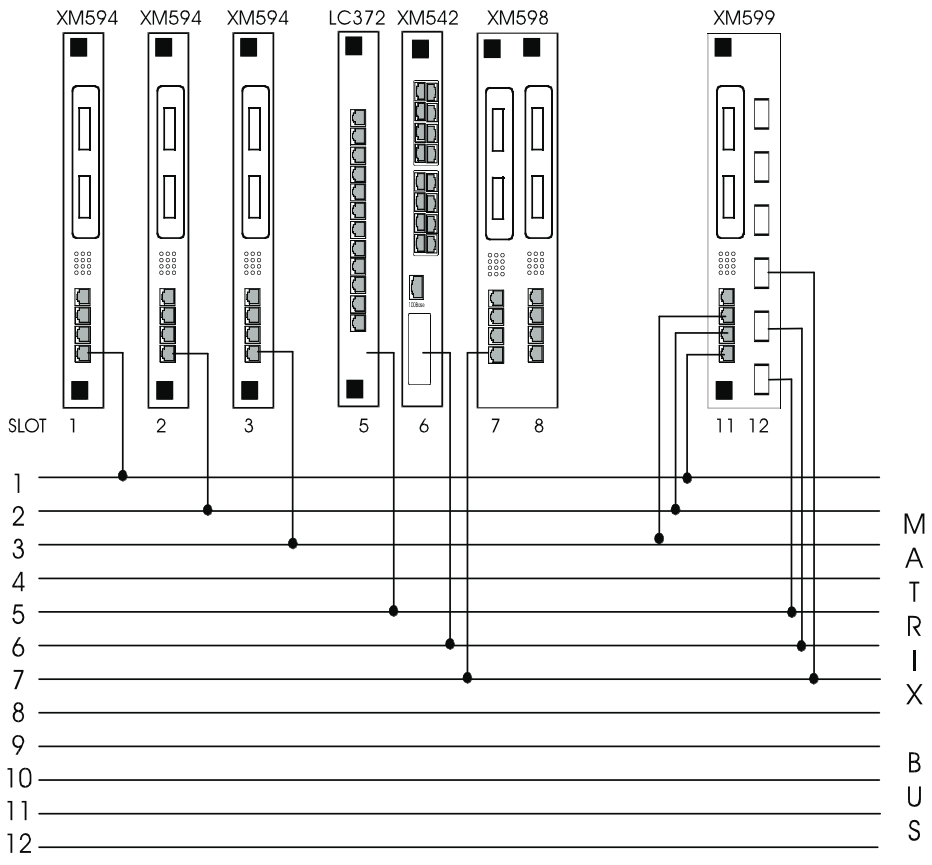


Figure 3: Combination of Backplane Connections in GigaHUB Matrix Bus Topology

To arrive at the configuration in Figure 3, follow the procedure below:

Switch Connections

1. From the GigaHUB LCD Main Menu, choose *Expanded Card Cmds* to open the **Expanded Card Commands** window.
2. Verify that Slot = 1 and Card = XM594.
3. Press NEXT to move to COMD field.
4. Scroll UP until COMD = Diagonal Port.
5. Press NEXT to move to PARAM field.
6. Scroll UP until PARAM = Enable and press Enter. The screen should read “Successful execution of command”.

   Follow the above procedure for slots 2, 3 and 7, making sure that Slot = appropriate slot number, and Card ID = the correct XM59x card installed in that slot.

7. Go to **Serial Buses** screen and select Serial Buses Per Resource option (2) to open the **Serial Buses Per Resource** window. Through this window it is possible to configure each resource to a backplane bus.

   e.g. Slot: 1 Card ID: XM594

   Res. Index: 1 Res. Type: Eth-100SW

   Connect to bus num: 1 Here it is possible to choose the appropriate bus connection. The options are 0 for Disconnect or the number of the corresponding slot for Connect.

   Press <Enter> to receive confirmation of command process or error message.

   Follow the same procedure as above for each XM59x card (slots 2, 3, 7), making sure that the bus connection corresponds to Slot: (number).

Concentrator Connection

Go to **Serial Buses** screen and select Serial Buses Per Resource option (2) to open the **Serial Buses Per Resource** window. Through this window you establish the backplane connection between the concentrator switch in Slot 11and the other switch cards residing on the matrix bus.

e.g. Slot: 11 Card ID: XM599

Res. Index: 1 Res. Type: Eth-100SW

Connect to bus num: 1 This number should correspond to the slot number of the card to which you are connecting the concentrator switch.

Press <Enter> to receive confirmation of command process or error message.

Follow the same procedure as above for each resource index (slots 2, 3, 7), making sure that the bus connection corresponds to Slot: (number).

To verify that the bus connection for each slot is correct, make sure that Index: (#) = Connect to bus num:(#)

APPLICATIONS

Typical network applications for the XM59x would include interlinking Fast Ethernet hubs; interlinking 10/100 workgroup switches and 10 and 100Mbps Ethernet segments; creating a Fast Ethernet backbone; driving high-bandwidth application servers; connecting 10/100 networks with ATM or Gigabit backbone/WAN connections; connecting to other GigaHUB cards such as XM542, XM53x, the LC372 Repeater and other XM59x cards.

Configuring Your Network

Links to a File Server

Intense client/server traffic on the LAN may limit overall network performance. Fast Ethernet allows the file server to communicate at 100Mbps to a 10/100 switch such as the XM59x, which then distributes the traffic to several 100Mbps ports or 10Mbps ports.

Links Between Switches

Links that run at more than 10Mbps are essential between switches. If the link between two switches is at 10Mbps, then only one full speed Ethernet stream can be handled at a time. With the 100Mbps connection of Fast Ethernet, 10 full-speed Ethernet streams can be handled simultaneously using half duplex. With full duplex, 20 full-speed symmetrical streams may be handled simultaneously.

An Ethernet to Fast Ethernet switch offers the network administrator a possible upgrade path. At first, the switch can be used simply to segment the existing Ethernet, immediately boosting performance. Next, with the addition of a single 100Mbps NIC, a file server can be migrated to Fast Ethernet, increasing its availability. As needed, additional file servers or individual users can be moved to Fast Ethernet, while leaving all other parts of the network running as usual. If some of the shared Ethernet segments are still congested, but don't warrant a full 100Mbps, additional switches may be added to further divide the shared segments, creating a collapsed 100Mbps backbone and small switched 10Mbps segments. The XM59x's auto-negotiating 10/100 ports provide unmatched flexibility because they allow the network administrator to upgrade the network devices to 100Mbps as needed; existing 10Mbps hardware is fully compatible with the XM59x.

Finally, if a network's bandwidth needs outstrip even 100Mbps shared workgroups, the XM59x can be used to create a fully switched Fast Ethernet network. Fast Ethernet works 10 times faster than regular Ethernet. Software, except for low level drivers which are always card specific, works with Fast Ethernet without modification. Frames from a device using Fast Ethernet require no translation except for the physical layer conversion.

The XM59x cards combine switched 10Mbps Ethernet and Fast Ethernet technology in a seamless integration of regular Ethernet and the IEEE 802.3u 100Base-TX standard. making them an ideal base from which to begin migration to Fast Ethernet or create a fully switched Fast Ethernet environment.

Typical Configurations

The following four configurations illustrate the versatility and flexibility offered the network administrator by the XM59x family in the creation and management of a powerful corporate network.

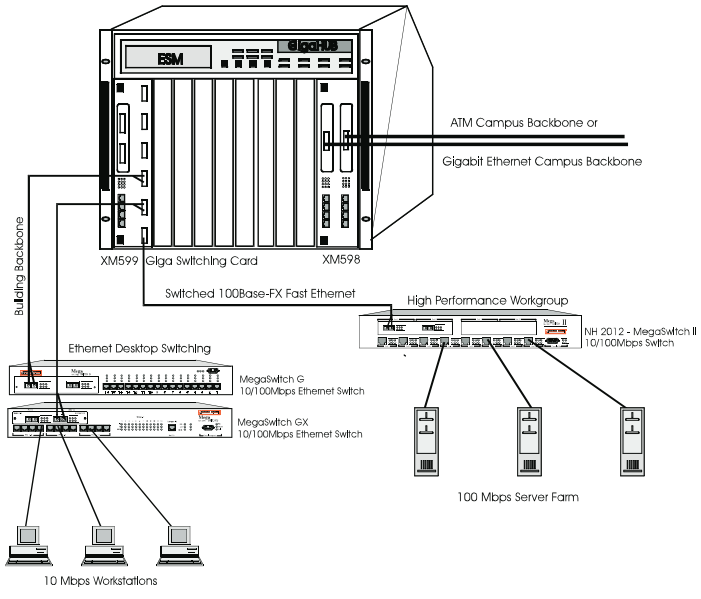


Figure 4: GigaFrame Solution for Building Backbones

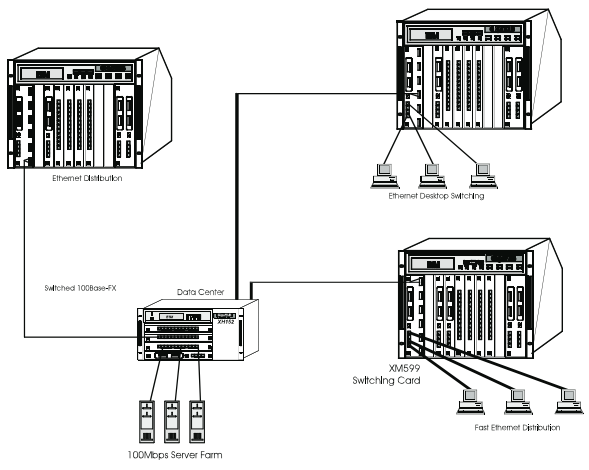


Figure 5: Collapsed Switched Fast Ethernet Backbone

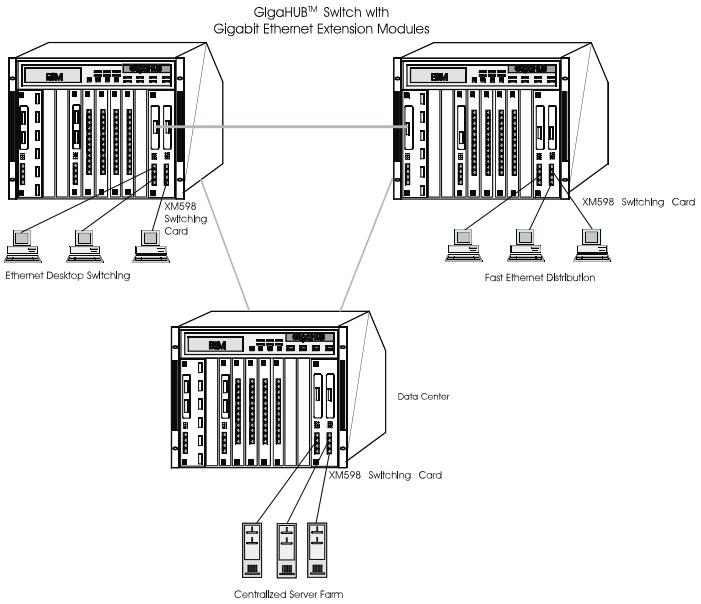


Figure 6: Gigabit Ethernet Backbone Solution

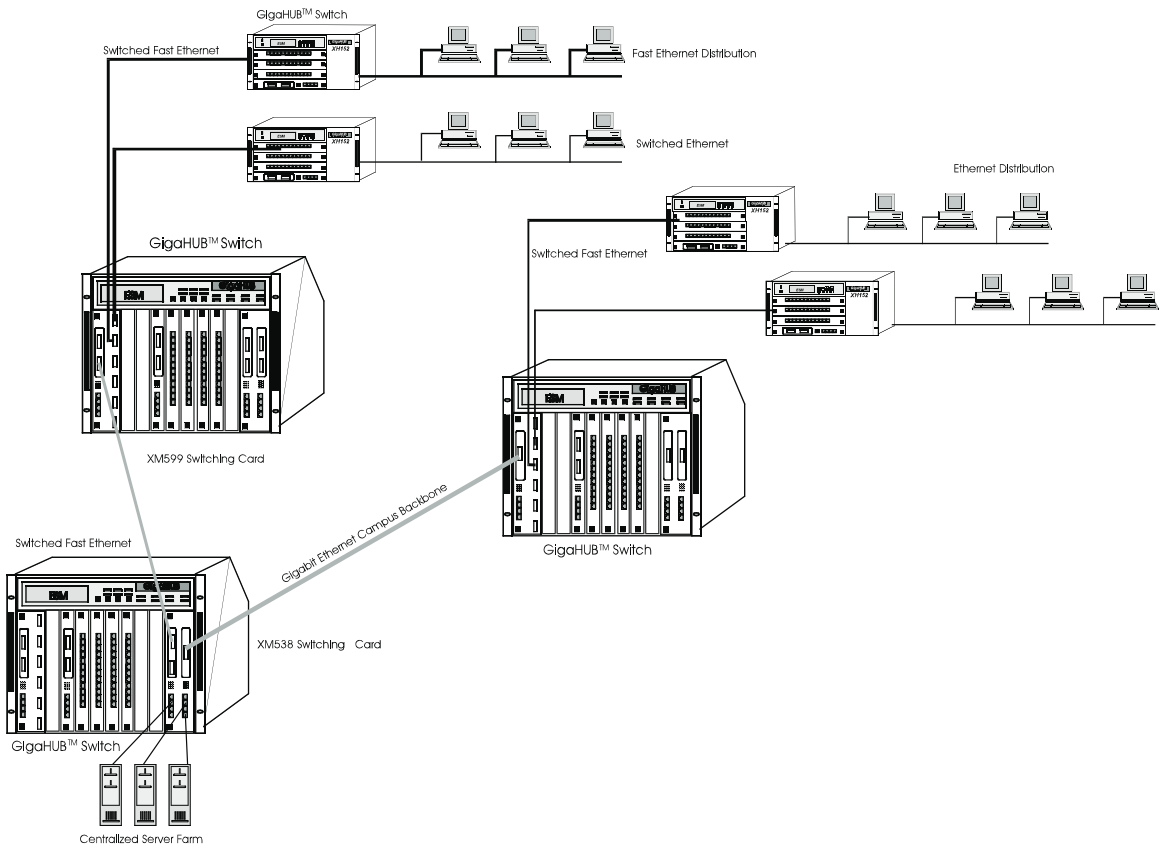


Figure 7: Enterprise Solution

INSTALLATION and SETUP

Unpacking and Inspection

Upon receiving the XM59x, inspect the carton for visible external damage. If the carton is damaged, request that the carrier's agent be present during unpacking and do not destroy the shipping carton.

After removing the XM59x, examine it for obvious physical damage such as dents or dislodged components. In case of damage, notify the carrier and follow his instructions for damage claims. In addition, inform your NBase representative immediately, providing specific details of the damage. The representative will arrange for repair or replacement. If necessary, retain the carton and packing material for return shipment.

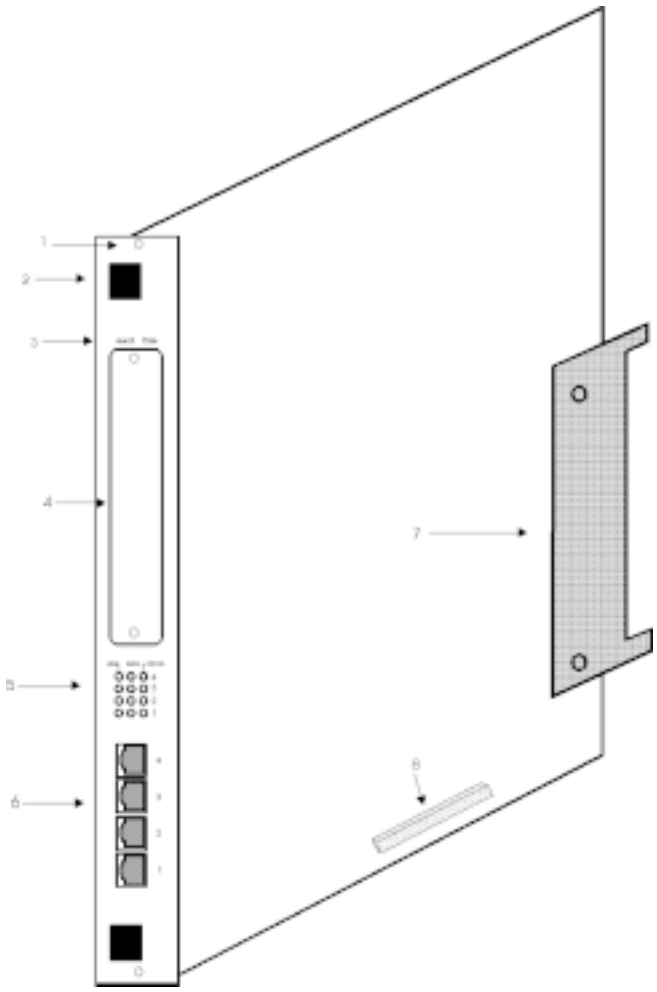
Installing the XM59x

This section outlines the installation and operation of the XM59x. The XM59x family are installed in the GigaHUB System, occupying either one or two slots, depending on the specific card.

Front Panels

The front panels of the XM59x are illustrated below in Figure 9 and 10. The various components, LED indications and their functions are identical from panel to panel.

See **Technical Specifications** for descriptions of LEDs.



1. Captive screw(s) for attaching XM59x to GigaHUB chassis
2. Extractor handle(s) for removing card from GigaHUB chassis
3. Global LEDs
   - RUN
   - STA
4. Panel for housing uplink modules
5. LEDs for RJ-45 Ports
   - LINK
   - DATA
   - C/FDX
6. RJ-45 Ports
7. Connector for attaching XM59x to GigaHUB backplane
8. Female connector for attaching EM594, EM598 and EM599 modules

Figure 8: Front Panel View XM594

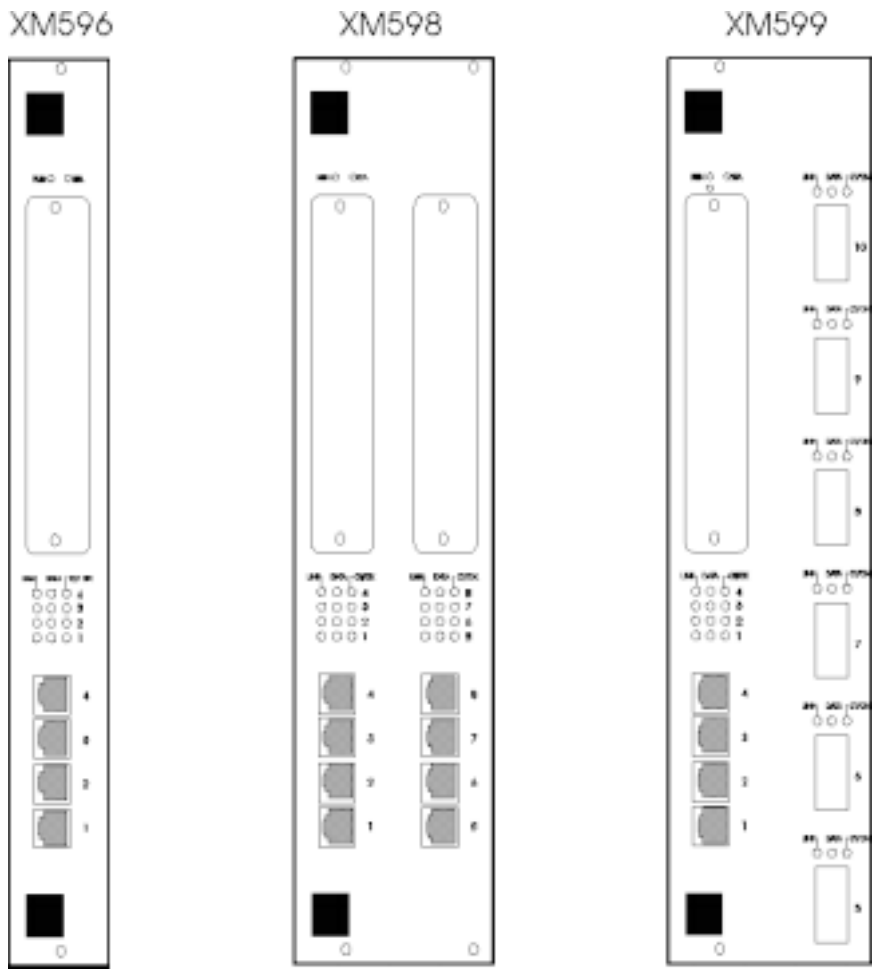


Figure 9: Front Panel Views XM596; XM598; XM599

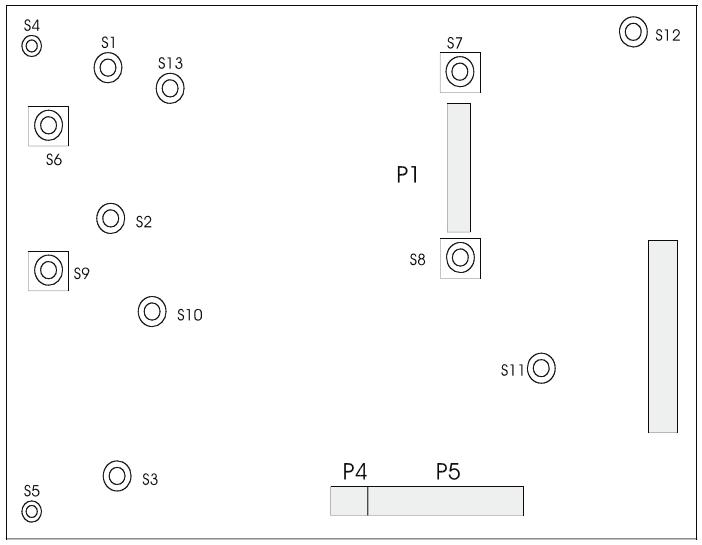


Figure 10: XM59x PCI board screws

Installation Specifications

The following tools are required to correctly mount the XM59x switch cards:

- 6” flat-tip screwdriver
- 6” Phillips screwdriver

Please refer to Figures 9, 10 and 11 during the mounting procedure.

XM59x The XM59x is installed in a single slot of the GigaHUB™ System and is hot-swappable.

1. Hold the XM594 by the two extractor handles (Fig. 9) and insert it into its allocated slot in the GigaHUB chassis. Upon reaching the GigaHUB backplane, push the extractor handles towards each other to secure the XM594.
2. Tighten the two captive screws on the XM594 panel.
3. The self-test diagnostics for the XM594 will run for about half a minute.

   The **RUN** and **STA** LEDs turn ON at Power UP and stay ON for the duration of the diagnostic cycle. Upon the successful completion of the self-test, the **STA** LED turns OFF.

   If the **RUN** LED turns OFF but the **STA** LED is turned ON, the self-test has failed.

   During normal operation, **RUN** ON and **STA** ON indicates a global error.

Self-test Diagnostics:	**RUN**	**STA**	
	ON	ON	Self-test in progress
	ON	OFF	Normal Mode
	OFF	ON	Self-test failed
	ON	BLINKING	Waiting for download

4. On the GigaHUB LCD, open the Expanded Card Commands window to verify that the XM594 appears, indicating that the GigaHUB has identified it.

Upgrading from XM594 to XM596

The XM596 consists of the basic XM594 card and the EM 594 module. It is installed in a single slot of the GigaHUB chassis and is hot-swappable.

1. Remove the XM594 module from the GigaHUB chassis.
2. Change the name sticker on the top extractor handle.
3. Fit the EM594 module onto the XM594 card by aligning the EM594 male connector with the XM594 female connector (P4, P5). The EM594 female spacers should fit into S10 and S11.
4. Secure the EM594 module with screws on the print side of the card.
5. Insert the XM596 back into the GigaHUB slot as per XM594 instructions above.

NOTE *The XM598 and XM599 cards are not field-upgradable.*

Expansion Modules	**GigaHUB Chassis**	**MegaSwitch II**
	EM590	NH 2002FD
	EM591/TX	NH 2002MP
	EM591FO/x	NH 2002FO/x
	EM591MV/x	NH 2002MV/x
	EM592ATM	NH 2002ATM
	EM593/S1	NH 2002GE

The following instructions are correct for the installation of all expansion modules:

1. Remove the XM59x card from the GigaHUB chassis; unscrew and remove the blank panel.
2. Slide the uplink into the slot along its runner.
3. Tighten the two uplink screws; reinsert the XM59x card.

TROUBLESHOOTING

The XM59x cards are highly reliable. If you encounter an operating problem, follow the troubleshooting steps below. If the problem persists, contact your local NBase representative.

1. Check if the STA LED is OFF. If it is ON, invoke Reset for the card in the **GigaHUB Card Hardware Reset** window. The STA LED remains ON during the 10-second diagnostic self-test, then turns OFF if the unit is operating properly.
2. Review all link LEDs to ensure that those ports you believe should be functioning are properly attached to a cable.
3. Verify that your cables are wired correctly; i.e. use a UTP crossover cable to connect another MDI-X device (such as a hub or switch) directly to a port. Use a straight cable to directly connect a workstation or an NH 2007.
4. Review all link LEDs to ensure that those ports you believe should be functioning are properly configured, and not disabled, partitioned or attached to an internal bus (LINK LED is yellow). If the suspect ports are disabled or do not seem to be configured properly, reconfigure the port through SNMP management or the Administrative Interface. If the ports are connected to the backplane, disconnect them and try a connection to another port.
5. Review all Full Duplex LEDs to ensure that those ports you believe should be functioning are in the correct mode of operation.
6. Ensure that the equipment attached to the switch is properly configured.
7. When working with some 3COM 10Base cards, you may have to force the port to operate in 10Base, half duplex if your PC does not establish a connection to the network.

If you encounter any situations or problems you cannot solve, obtain, if possible, the following information:

- The serial number of your card and its hardware address
- The configuration of the equipment that is being interfaced with the switch
- The sequence of events leading up to your problem
- Troubleshooting procedures you have already followed

After compiling the above information, contact your local NBase representative or a Customer Service Representative. In addition, if you have specific questions about your network configuration, or have a particularly difficult network, please call our technical support.

Tel: (972) 4-993-6200, (972) 4-993-6271 or (972) 4-993-6257
Fax: (972) 4 989-2743

E-mail: support@nbase.co.il

SPECIFICATIONS

Technical

Compatibility

IEEE 802.3u (Fast Ethernet Standard)
SNMP (RFC 1157)
MIB II (RFC 1213)
IEEE 802.1d (Bridge/Spanning Tree)
RMON (Groups 1, 2, 3) FDSE
Bridge MIB (RFC 1493)

Electrical

Power Consumption	**XM594**	7.5A (5 P.U.)	**XM596**	11A (7.5 P.U.)
	XM598	12A (8 P.U.)	**XM599**	15.5A (10.5 P.U.)
	EM590 to EM593 Expansion Modules		2A max	(1.4 P.U.)

Connectors

UTP	RJ-45 (100Base-TX)
F/O	SC (100Base-FX)

Buffers 64KB per port

Addresses 4086 entries

Diagnostics

100Base Ports	**LINK**	Green	Indicates external link
		Yellow	Indicates backplane link
	DATA	Green	Indicates Rx or Tx activity
	C / FDX	Green	Blinking indicates collision
		Green	Constant indicates Full Duplex
Global	**RUN**	Green	Card Status LEDs, see pg 12
	STA	Amber	Card Status LEDs, see pg 12
	EM59x	Green	Indicates presence of EM59x

Performance

Filter/Forward Rate	800,000 / 800,000 pps
Aggregate Bandwidth	1 Gbps
Learning Rate	360,000 pps

Physical	**H x D x W**	**Weight**	**Mounting**
XM594	300 x 276 x 35 mm 12” x 11” x 1.4”	< 1 kg < 2.2 lb	One GigaHUB slot
XM596	300 x 276 x 35 mm 12” x 11” x 1.4”	< 1.5 kg < 3.3 lb	One GigaHUB slot
XM598/9	300 x 276 x 70 mm 12” x 11” x 2.8”	< 1.5 kg < 3.3 lb	Two GigaHUB slots

Environment

Operating Temperature	0°C to 40°C	32°F to 104°F
Storage Temperature	-10°C to 50°C	14°F to 122°F
Humidity	85% maximum, non-condensing	

Standards Compliance UL-1950; CSA 22.2 No 950; VCCI; FCC Part 15 Class A; CE - 89/336/EEC, 73/23/EEC

General

Characteristic	Description	Note
External Ports Count		
XM594: 4 10/100Base-Tx XM596: 4 10/100Base-Tx	Half/Full with Autonegotiation and Autosensing; steerable to backplane	
XM598: 8 10/100Base-Tx		XM598/9 are field upgradable up to twelve 10/100Base ports
XM599: 10 10/100Base-Tx/Fx		
Backplane Ports		
XM594: up to 4 100Base-TX XM596: up to 8 100Base-TX XM598: up to 8 100Base-TX XM599: up to 10 100Base-TX	Ports 5 to 8 are not seen on the front panel	
Modules		
Two 10/100Base-Tx	Half/Full with auto-negotiation and auto-sensing	
Two 100Base-Fx	Half/Full Duplex; SM and MM	
One ATM OC-3 155Mbps	Single port ATM port	ATM Forum LAN emulation
One Gigabit	Full Duplex, singlemode and multimode	
One 100Base-Fx with Interswitch VLAN		
EM594 - 4 10/100Base ports	Backplane connection only	For upgrading XM594 to XM596; Support for 256 VLANs Slots 5-8

Switching	Store and forward	
Explicit Flow Control	In port (Inter Switch flow control)	Only on modules and port #1
Implicit Flow Control	In all ports (Backpressure)	
Port Mirroring	On incoming and outgoing traffic	
VLAN	256 VLANs (Port grouping)	
Cache Aging Time	Manageable	
Custom Filtering	By hardware address and port	
Network Management	In-band and out-of-band SNMP w/MIB II, private MIB and out-of-band serial console support	
Boot and Configuration	NVRAM configuration loaded on power up and fully downloadable; firmware local/remote downloadable	
Addresses Table	Transparent, automatic self-learning at full wire speed; cache aging time manageable; custom filtering by hardware address & port	
Troubleshooting		
Startup Diagnostics	Self-test on power up	
Run-Time Diagnostics	Front panel and ESM LEDs, CLI, NMS	MegaVision

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OVERVIEW

The XM59x contains a built-in SNMP agent running on the SNMP Processor Board. This allows each card to be managed from a centralized management station via any SNMP-compliant NMS.

The SNMP agent software complies with the following standards:

- RFC 1155 - The Structure of Management Information (SMI) for TCP/IP Based Internets, May 1990
- RFC 1556 - Management Information Base (MIB) for Network Managers of TCP/IP Based Internets, May 1990.
- RFC 1557 - The Simple Network Management Protocol (SNMP), May 1990.
- RFC 1213 - The Management Information Base II (MIB II), March 1991.
- RFC 1643 - Definitions of Managed Objects for the Ethernet-like Interface Types.
- RFC 1573 - Evolution of the Interfaces Group of MIB-II, January 1994.
- RFC 1493 - Definitions of Managed Objects for Bridges, July 1993.
- RFC 793 - Transmission Control Protocol
- RFC 854 - Telnet Protocol Specification
- RFC 1055 - Non-standard for transmission of IP datagrams over serial lines: SLIP, January 1988

The SNMP agent utilizes UDP/IP (RFC 768, RFC950, RFC1071 and RFC791) as OSI layers 3 and 4 protocols, ICMP (RFC792) and ARP(RFC826) to complete the UDP/IP protocol suite.

The UDP/IP stack implementation is conformant to:

- RFC 1122 - Requirements for Internet hosts - communication layers.
- RFC 1123 - Requirements for Internet hosts - application and support

The XM59x may be managed by any SNMP Manager that conforms to the above standards. It may be fully managed by MegaVision, NBase's multi-platform network management system. For more information on MegaVision, view our web site, or contact NBase for a data sheet.

The XM59x implements an NBase Enterprise MIB that may be provided upon request.

THE XM59x AND NETWORK MANAGEMENT SYSTEMS

The XM59x cards comply fully with GigaHUB's management architecture for local or remote access and downloading of firmware updates, enabling the SNMP Manager (MegaVision NMS) to perform all the management functions provided by the GigaHUB. Front panel LEDs display current status for simplified installation and maintenance.

The XM59x can also be managed locally via the GigaHUB's LCD. Details are provided in *GigaHUB Management.*

GigaHUB Management

The operational status of the XM59x can be monitored on the card's front panel LEDs and on the GigaHUB LCD. See *Installing the XM59x* for details of card status LEDs, and *Front Panel* for details of port status LEDs.

GigaHUB LCD

Card Status/Commands Window

This window is used for comprehensive XM59x monitoring. Access to it is described in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.4.

The status parameters of the XM59x are described in the window as the curser is moved across the LEDs. The description for a LED is true if the LED (circle) is filled black; otherwise, the complementary possibility is true. The descriptions are summarized in Table 1 below, which shows the LEDs, Channels and LED functions.

Table 1: XM59x Status using GigaHUB Card/Stat/Cmds Window LEDs

	GigaHUB Card Status/Commands Window LEDs														
Giga-HUB Chan.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	P 1 Link ON	P 1 Fctrl ON	P 1 Speed 100	P 1 Fdplx	P 1 Detach	Spare	P 2 Link ON	P 2 Fctrl ON	P 2 Speed 100	P 2 Fdplx	P 2 Detach	Diag Port ON	Global Span. Tree Disabl	Spare	Spare
2	P 3 Link ON	P 3 Fctrl ON	P 3 Speed 100	P 3 Fdplx	P 3 Detach	Spare	P 4 Link ON	P 4 Fctrl ON	P 4 Speed 100	P 4 Fdplx	P 4 Detach	Spare	Spare	Spare	Spare
3	P 5 Link ON	P 5 Fctrl ON	P 5 Speed 100	P 5 Fdplx	P 5 Detach	Spare	P 6 Link ON	P 6 Fctrl ON	P 6 Speed 100	P 6 Fdplx	P 6 Detach	Spare	Spare	Spare	Spare
4	P 7 Link ON	P 7 Fctrl ON	P 7 Speed 100	P 7 Fdplx	P 7 Detach	Spare	P 8 Link ON	P 8 Fctrl ON	P 8 Speed 100	P 8 Fdplx	P 8 Detach	Spare	Spare	Spare	Spare
5	P 9 Link ON	P 9 Fctrl ON	P 9 Speed 100	P 9 Fdplx	P 9 Detach	Spare	P 10 Link ON	P 10 Fctrl ON	P 10 Speed 100	P 10 Fdplx	P 10 Detach	Mod ID Bit 3	Mod ID Bit 2	Mod ID Bit 1	Mod ID Bit 0
6	P 11 Link ON	P 11 Fctrl ON	P 11 Speed 100	P 11 Fdplx	P 11 Detach	Spare	P 12 Link ON	P 12 Fctrl ON	P 12 Speed 100	P 12 Fdplx	P 12 Detach	Mod ID Bit 3	Mod ID Bit 2	Mod ID Bit 1	Mod ID Bit 0

Cards Status Window

This window provides general status information about the XM59x. Details are provided in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.5.3.

Cards Type Window

This window shows the type of LAN Card identified for each LAN Card in a GigaHUB slot. Details are provided in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.2.1.1.

Card Versions Window

This window shows the XM59x version. Details are provided in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.2.1.2.

Serial Buses Per Resource Window

This window is used to attach XM59x cards housed in a GigaHUB to Eth100SW resources. Details are provided in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.2.1.3.2. The procedure for attaching an XM59x to any one or more of the resources is described there, as well.

Slots Assignment Window

This window is used to view all the resources allocated to all the LAN Cards in the GigaHUB. Details are provided in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.2.1.3.3.

ESM/LAN Attach Window

This window is used to assign the ESM Management Bus or the LAN as the medium of access. Details are provided in the GigaHUB User's Manual, Part B, Extended System Manager.

Individual IP Parameters Window

If the XM59x in the displayed slot was already configured, the IP parameters are also displayed in the window.

The window parameters are as follows:

Slot	The number of the GigaHUB slot housing the card whose IP parameters are displayed/set up. Slots without SNMP Agents are skipped.
Card Type	The type of the card
IP Address	The 32-bit IP address of the XM59x, presented in the format XXX.XXX.XXX.XXX, where XXX is the decimal value of an IP address byte. The IP Address must be entered for direct card-to-SNMP_Manager inband communication.
Subnt Mask	Used to extract the Host ID from the IP address, in a subnetted network architecture. When the cursor is moved out of the first byte of the IP Address input field, the Subnt Mask input field value assumes the default mask value for the IP address class (A,B, or C).
Bcast Type	The type of broadcast messages (all 1s or all 0s). The field is for future use and does not need to be changed at present.
Default GW	IP address of the Default Gateway through which the card communicates with the remote subnetworks. The Default Gateway should reside on the local XM59x subnetwork (eg, Ethernet or FDDI). The default value 000.000.000.000 means no Default Gateway.

Each one of the **IP Address** and **Subnet Mask** parameters consists of four bytes, in decimal representation. Each one of these byte locations is one input field.

Pressing the **NEXT FIELD** pushkey advances the cursor in 1-byte steps.

Pressing the **SCROLL UP** pushkey increments the decimal value of the byte indicated by the cursor in steps of 1, in cyclic order.

Pressing the **SCROLL DOWN** pushkey decrements the decimal value of the byte indicated by the cursor in steps of 1, in cyclic order.

To increment the decimal value in steps of 10, hold down the **SCROLL UP** pushkey. The incrementation begins at the next decade value (eg, 20, 30, etc).

To decrement the decimal value in steps of 10, hold down the **SELECT FUNCTION** and **SCROLL DOWN** pushkeys. The decrementation begins at the previous decade value (eg, 20, 30, etc).

To register and activate the parameter values in the window:

1. Move the cursor to the **Slot** input field and select your choice (1 to 12).
2. Move the cursor to the **IP Address** input field and select the value. If the first byte of the IP address is changed, the Subnt Mask value gets adjusted, if necessary, as soon as the cursor is moved to the second byte of the IP address.
3. Move the cursor to the **Subnt Mask** input field and select the value.
4. Move the cursor to the **Default GW** input field and select the value.
5. Press **ENTER** to register the values.

Generic information on this window (Individual IP Parameters window) is given in the GigaHUB User's Manual, Part B, Extended System Manager.

Commands

Expanded Card Commands Window

The following commands are invocable in the Expanded Card Commands window (described generically in the GigaHUB User's Manual, Part B, Extended System Manager, Section 5.3):

Table 2: Expanded Card Commands Window Commands/Parameters

Command	Parameters
Reset Card	Cold, Warm, Init NVram
Global Sp Tree	Enable, Disable
Diagonal Port	Enable, Disable
Attach port	P 1 - Num of Installed ports
Detach port	P 1 - Num of Installed ports
Set FullDplex	P 1 - Num of Installed ports
Set HalfDplex	P 1 - Num of Installed ports
Set FctrlOn	P 1 - Num of Installed ports
Set FctrlOff	P 1 - Num of Installed ports
Set SpeedAutoSense	P 1 - Num of Installed ports
Set Speed100	P 1 - Num of Installed ports
Set Speed10	P 1 - Num of Installed ports

ACCESSING THE SNMP AGENT

Console Management

This section describes how to use the console services to configure and manage the XM59x.

Connecting to the Administrative Interface

The GigaHUB ESM allows access to the CLI facility of a card in the GigaHUB. It routes CLI commands from the host (eg. VT100 terminal), via the GigaHUB Management Bus, to the addressed card for decoding/emulation, and drives the card responses to the Management Bus. The CLI commands and responses are encapsulated in a Data Link Layer (DLL) frame format.

Setting Up and Starting the Local Console

System Requirements

Hardware Requirements

- XM59x card
- Either a VT100 terminal or a VT100 terminal emulator running on a workstation or PC
- Straight-through RS-232 cable with a 9-pin male D-subminiature connector on one end and an appropriate connector on the other end to attach to the VT terminal or VT100 terminal emulator.

Software Requirements

If you are using a workstation, use the VT100 terminal emulation software appropriate for your workstation.

If you are using a PC to emulate a VT100 terminal, you can use the following software:

- In a DOS environment: - MS-DOS 3.30 or later
  - PROCOMM PLUS for DOS
- In a Windows environment: - Microsoft Windows 3.1 or later
  - Windows Terminal or PROCOMM PLUS for Windows

NOTE *Because of their compatibility and reliability, the software combination listed above are recommended. Other applications may also provide satisfactory results.*

VT100 Terminal Settings

Use the following modem settings when connecting the VT100 terminal or terminal emulator to the XM59x

- Press the Setup key (identified on the screen's prompt bar) and set the parameter values as follows:

  General Setup
  - VT100 Mode
  - Application Keypad

  Communications Setup
  - Transmit = 9600 (baud)
  - Receive = Transmit
  - 8 Bits, No Parity
  - No Local Echo
- Terminate the setup session by keying Ctrl-C

To start the local console, follow the steps below:

- Connect a VT100 terminal or a VT100 terminal emulator to the Outband DB9 connector on the GigaHUB using a straight-through RS-232 cable.
- Make sure both units are powered on.
- To establish connection to the CLI as well as to display the GigaHUB CLI Main Menu for the XM59x:

For	Press
VT100 terminal	BREAK key
PC VT100 Terminal Emulator	CTRL-BREAK key
Procomm	ALT-F7 keys

In response to pressing the BREAK key, the CLI Main Menu window will display a list of cards having CLIs (eg. XM59x). To select a card, move the cursor to the row and press ENTER.

When the command line appears, you can enter the console commands.

To return to the CLI Main Menu from any other window, press the CTRL-C key or type *logout*.

Configuring the SNMP Agent

Logging into the Administrative Interface

The Administrative Interface is protected against usage by inappropriate personnel. To access the Administrative Interface the Network Administrator has to provide his name and a password.

```
Please Login
username: don
password: (not echoed)
```

As configured at the factory the password consists of a null string. To enter the first time, just press <Enter>. Once you have logged into the Administrative Interface you may change the password in order to avoid undesired access.

Setting the IP Address

To manage the MegaSwitch using an SNMP Network Management Application or to use the ping command to test the switch, it is necessary to assign an IP Address, a netmask and a broadcast address. The IP address should be assigned by the Network Administrator in accordance with the existing IP network.

Set the IP configuration with the “set-ip-conf” command.

```
SYS_console> set-ip-conf 192.1.1.64 255.255.255.0 192.1.1.255
```

NOTE *If the switch has no IP Address, then the provided IP Configuration will change the running parameters as well as the NVRAM-based database. If the switch was already configured for the actual session, the parameters will change only the NVRAM database. In order to use these new parameters it is necessary to reset the Switch, using the <warm-reset> command.*

You may also use the “set-ip” command, eg:

```
set-ip 192.1.1.64
```

In this case, the Agent will automatically determine the netmask and broadcast address.

Testing the Installation

After you have completed the installation and configured the IP Address, use the Administrative Interface ping command to test for connectivity.

The ping command sends an echo request to the host specified in the command line. For example, to test connectivity from the Switch to a workstation with an IP Address of 192.1.1.1, use the following command:

```
SYS_console> ping 192.1.1.2 2
SYS_console>
Use CTRL-C or ping-stop to stop the ping process
192.001.001.002 Alive. echo reply: id 8495, seq 1, echo-data-len 0
192.001.001.002 Alive. echo reply: id 8495, seq 2, echo-data-len 0
PING process stopped - statistics :
ICMP echo requests   :          2
ICMP echo responses  :          2
PING process - press <CR> for prompt
SYS_console>
```

Accessing the Administrative Interface Remotely

After configuring the IP address of the Switch, the administrative interface can be accessed remotely through Telnet. All commands work exactly as if the serial interface were being used. Please note that only one console session may be active at any given time. This means that after the first Telnet session is established, all other Telnet connections will be refused until the current session is closed. From the serial interface, the remote console session may be terminated by pressing <Enter> three (3) times.

USING THE ADMINISTRATIVE INTERFACE

This chapter provides instructions for using the XM59x Administrative Interface.

Features of the Administrative Interface

The Administrative Interface provides the following:

- Configuration of system parameters, including the serial line and/or the console's parameters
- Configuration of the switch's SNMP Agent parameters
- Configuration of the ports' parameters.
- Network performance monitoring.
- A fail-safe back-up for in-band management.

Entering Commands

Enter commands by typing the command name followed by zero or more parameters and pressing <**enter**>**.** For example, typing <`banner`> <**enter**> at the command prompt displays the Administrative Interface logo.

Items typed in `courier` are to be typed literally, or read directly from the screen.

Italicized items are variables and represent values. For example, <*IPaddress*> represents an IP address in dotted decimal notation as 123.1.2.3.

Items in the Times New Roman font (this font) appearing on a line are hints to the user (not actually displayed on the screen).

Items in **{ }** and separated by **|** represent alternatives for the argument.

```
get-comm  {read | write | *}
```

means you can type one of:

```
get-comm read
get-comm write
get-comm *
```

If you enter a command incorrectly, a message is displayed indicating the type of error that occurred. For example, typing a nonexistent command gives the following message:

```
SYS_console> pin
command <pin> not found
```

If the command exists but the number of parameters is incorrect, the following message is displayed:

```
SYS_console> ping
too few arguments
```

To get an explanation of the command's parameters add a question mark (?) after the command name:

```
SYS_console> ping ?
ping     IP traffic generator
   [arg #0]  destination IP address
   [arg #1]  number of packets to send or 0 for endless ping
SYS_console> ping _
```

Note that the command is reprinted after the prompt, and the user has only to add the necessary parameters. If a question mark is added after the first parameter, then the same explanation is provided, and the previous command, including the provided parameters, is redisplayed.

```
SYS_console> ping 129.1.1.7 ?
ping     IP traffic generator
       [arg #0]  destination IP address
       [arg #1]  number of packets to send or 0 for endless ping
SYS_console> ping 129.1.1.7
```

The Administrative Interface provides a history of the last commands. In order to obtain the last command in the the command history, press <!> or Ctrl-P at the prompt .

To correct a command line you may use the following special keys (see the `help-kbd` command):

· <!> or CTRL-P - for the previous command
· CTRL-W - to delete the previous word
· CTRL-U - to erase the entire line

When, as a result of a command, more than one screen-full of text is to be printed, the user may continue to scroll or stop the process.

```
SYS_console> ip

           IP related commands
-------------------------------------------------------------
 get-ip         show current IP address
 set-ip         set IP address
 get-ip-conf    show current IP configuration
 set-ip-conf    set IP address , netmask and broadcast
 set-slip       set slip IP address
 get-slip       get slip IP address
 get-slip-conf  show current IP configuration
 set-slip-conf  set IP address , netmask and broadcast
 get-gatew      show default gateway
 set-gatew      define default gateway
 get-arp-tbl    display the ARP table
 del-arp-entry  deletes an entry/all entries(*) of the ARP tbl
 add-arp-entry  add an entry to the ARP table
 get-bootp      retrieves the state of the BOOTP process
 set-bootp      enables or disables the BOOTP process
 ping           IP traffic generator
 ping-stop      stop the ping process
 get-def-ttl    Retrieves the running default TTL value
Hit any key for more...                    (type 'q' to quit)
 SYS_console> _
```

User pressed q

Finally, the user may press <Tab> to see the list of commands which start with the text he has already typed, eg:

User pressed <Tab>

```
SYS_console> get-c
             Commands matching <get-c>
-------------------------------------------------------------
 get-comm       show current read or/and write community
 get-con-matrix retrieves the VLAN connectivity matrix
 get-colls-cnt  gets the collision dist. counters per port
SYS_console>
```

Administrative Interface Command Structure

The Administrative Interface has several categories of commands:

- Console related commands: help, banner, serial line setup, console parameters setup, etc.
- System related commands: reset commands, download commands, initialize the NVRAM with defaults, etc.
- IP commands: parameter setup, parameter and information display, etc.
- SNMP agent related commands: parameter setup, management and traps options
- Switching Database related commands: aging time management and Switching Database entry management
- Spanning Tree related commands
- Virtual LAN commands
- Port Configuration related commands
- Switching statistics commands

Console Commands

The console commands contain a set of commands which allow the user to configure the Administrative Interface parameters and user interface.

?

Typing **?** at the Administrative Interface prompt displays a list of all the available commands and a short explanation about each. Typing in one of the names on this list will yield a list of the commands under that topic.

```
SYS_console> ?
  Commands groups are:
  ------------
  console               Console related commands
  system                System related commands
  ip                    IP related commands
  snmp                  SNMP related commands
  switch-db             Switching Database related commands
  vlan                  Virtual LANs related commands
  port-cfg              Port Configuration related commands
  statistics            Switching Statistics related commands
  sp-tree               Spanning Tree related commands
-------------------------------------------------------------
use ! for prev. cmd, ^U to clr line, ^W to clr previous word
-------------------------------------------------------------
SYS_console>
```

help-kbd

This command lists the console function keys.

```
  SYS_console> help-kbd
   ?       -  for a list of the commands
   ! or ^P -  for previous command
   ^U      -  to clear the line
   ^W      -  to clear the previous word
  SYS_console>
```

banner

The banner command will display the MegaSwitch NBase Administrative interface logo.

clear

The clear command will clear the screen and display the prompt.

login

The login command will exit the Administrative Interface, but will not disconnect a Telnet session. This allows the user to test a password (or other activity) without reconnecting.

logout

The logout command will finish the actual Administrative Interface Session. Any further access will request the user to login again.

set-prompt

`set-prompt <new_prompt>`

The set-prompt command allows the user to set a new command line prompt for the Administrative Interface. With the prompt command, you can set a more meaningful prompt, such as a location of the switch, or the name of a workgroup. The default prompt is SYS_console> .

```
SYS_console> set-prompt R&D_grp>
 CLI prompt change in the NVRAM OK
R&D_grp> _
```

set-passwd

The console requires the user to enter a password in order to log in, preventing unauthorized access. The set-passwd command allows the user to change the console password. The system first prompts the user for the original password. Then the user is asked to input a new password, and then type it again for verification. At no time are any of the passwords echoed back to the user.

If the user enters the old password incorrectly or fails to verify the new password correctly, the password will not be changed.

```
SYS_console> set-passwd
Enter old password:           (not echoed back to screen)
Enter new password:           (not echoed)
Enter new password again:     (not echoed)
New password not verified - password not changed!
SYS_console> _
```

If the password change succeeds, the system will respond accordingly.

```
SYS_console> set-passwd
Enter old password:             (not echoed back to screen)
Enter new password:             (not echoed)
Enter new password again:       (not echoed)
 CLI running password changed
 CLI password change in NVRAM OK
Password changed!
SYS_console> _
```

System Commands

The System Commands allow the user to display and set the system-related parameters.

sys-stat

The sys-stat command displays general status information about the Ethernet Switch and its SNMP Agent Hardware and Software:

```
SYS_console> sys-stat

   NBase/Fibronics Ltd. XM59x MegaSwitch II Version V1.1
   SNMP Agent Software  - Version V1.1  Jul 13 1997 08:49:34
   SNMP Object ID is : < .1.3.6.1.4.1.629.1.1.5 >
   System MAC Address :  00-20-1A-01-06-7B
   Switching Data Base Size:     4096 entries
   Total uptime(hundredths of seconds ):    75048
   Total uptime(days, hh:mm:ss format): 0 days, 0:12:30.48

i/f  1 -- description [ Port  1 - 10/100 BaseTX    Ethernet Port] -- status [up]

i/f  2 -- description [ Port  2 - 10/100 BaseTX    Ethernet Port] -- status [up]

i/f  3 -- description [ Port  3 - 10/100 BaseTX    Ethernet Port] -- status [up]

i/f  4 -- description [ Port  4 - 10/100 BaseTX    Ethernet Port] -- status [up]

i/f  5 -- description [ Port  5 - missing ] -- status [DOWN]
i/f  6 -- description [ Port  6 - missing ] -- status [DOWN]
i/f  7 -- description [ Port  7 - missing ] -- status [DOWN]
i/f  8 -- description [ Port  8 - missing ] -- status [DOWN]
i/f  9 -- description [ Port  9 - missing ] -- status [DOWN]
i/f 10 -- description [ Port 10 - missing ] -- status [DOWN]
i/f 11 -- description [ Port 11 - missing ] -- status [DOWN]
i/f 12 -- description [ Port 12 - missing ] -- status [DOWN]
SYS_console>
```

The screen displays the following information:

- The device name and type
- The SNMP Agent Software version and release date
- The device SNMP Object ID
- The device MAC Address
- The system uptime in 1/100 sec as well as in days, hours, minutes and seconds
- The interfaces description and status

get-stst-level

This command shows the self-test level of the switch.

set-stst-level

`Usage:`

`set-stst-level <level>`

THIS COMMAND SHOULD ONLY BE USED BY A QUALIFIED NBASE ENGINEER.

This command shows the self-test level of the switch. There are four levels of self-test: none, short, long and diagnostics. The self-test level is stored in NVRAM.

The default self-test level is **short**. In this mode, the power-up sequence below is followed:

The OS/bootloader boots out of the ROM bank. The checksum of the SNMP software flash bank is verified for consistency. The bootloader prints a "#" to the serial console. It then waits 5 seconds for a download command from a PC running the firmware download software on the serial port. If, after 5 seconds, no download request is detected, the bootloader will run the self-test out of ROM space. The self-test then runs in 10-Mbps loopback mode and performs these three tests:

1. Loopback test. This tests the basic send/receive functionality of each port with varying frame sizes.
2. Broadcast test. This tests the basic forwarding capabilities of the bus by sending broadcast frames from each port with varying frame sizes.
3. Bus B test. This tests the secondary bus.

If the test succeeds, the SNMP software is copied from the Flash into main memory and is executed.

If any part of the test fails, the system will halt.

In **short** mode, the switch will wake up after 30-40 seconds (depending on the number of ports installed).

If the test level is **none**, no self-test will be performed and the SNMP software will be loaded immediately after the download timeout expires.

If the test level is **long**, a RAM check will be run on reset, and the self-test will perform many other tests. In this mode the switch will wake up after about 2 minutes.

NOTE *The switch should be **disconnected** from the network while the long test is executing.*

If the test level is **diagnostics**, the self-test will run in interactive mode. Typing <quit >at the debugger prompt will exit the tester and resume the boot sequence.

The interactive mode can also be entered by typing three escapes (<Esc> <Esc> <Esc>) in quick succession after the "#" appears.

If, during boot, the boot ROM determines that the flash checksum is bad, it will NOT timeout during the download sequence. Instead, it will wait there ad infinitum until a valid download request is received on the console. As before, three quick escapes will bring up the interactive self-test.

During the self-tests, individual tests can be skipped by pressing any key during the test.

warm-reset

The warm-reset command resets the SNMP Agent software without resetting the Switch. Nevertheless, the Switch configuration is changed according to the values stored in the NVRAM. This command will permit the user to refresh the Switch configuration after a change of the NVRAM parameters. The statistics counters are also reset by the warm-reset command.

cold-reset

This command causes the switch to cold-reset. Cold reset is equivalent to power cycling the Switch.

get-last-err

This command retrieves the most recent system failure for diagnostic purposes.

```
SYS_console> get-last-err
  System information since the last hardware reset
-------------------------------------------------

  Software resets number : 0
The system never encountered a fatal error
SYS_console> _
```

init-nvram

This command resets the non-volatile RAM on the SNMP Agent to default values.

get-sw-file

This command retrieves the SNMP Agent Software file name

set-sw-file

```
Usage:
  set-sw-file <filename>
```

Sets the name of the file downloaded by TFTP. This name must match the name of the agent software file on the TFTP server. When TFTP is used, the per-packet retransmission time-out value on the server must be increased to 10 seconds, since the SNMP Agent must first erase its flash EEPROM, which takes about 30 seconds.

get-rsw-file

This command retrieves the SNMP Agent Software remote file name.

set-rsw-file

```
Usage:
  set-rsw-file < filename>
```

Sets the name of the remote file downloaded by TFTP. This name will be sent to the TFTP server to retrieve the software when the sw-dnld command is used.

get-tftp-srvr

This command retrieves the IP address of the TFTP server which the Agent will use to download software (see **sw-dnld**) and upload paramters (see **par-upld**).

set-tftp-srvr

```
Usage:
  set-tftp-srvr < IP address>
```

Sets the IP address of the TFTP server used for uploading and downloading.

sw-dnld

This command begins the software download process to the TFTP server specified by the **set-tftp-srvr** command, retrieving the file specified by the **set-rsw-file** command.

get-par-file

This command retrieves the SNMP Agent Parameters file name.

set-par-file

Usage:

```
set-par-file <filename>
```

Sets the name of the SNMP Agent parameter file downloaded by BOOTP. This filename must match the name of the parameter file on the BOOTP server. The format of the parameter file is:

<switch_hardware_address> : <read_comm> : <write comm>

for example:

```
00-20-1A-00-01-23 : public : private
```

set-fg-param

Usage:

```
set-fg-param <dest> <source> <fill_byte> <length>
```

This command sets the frame generator parameters. *dest* and *source* are dash-separated hardware addresses in hex. *fill_byte* is a single byte used to fill the entire packet except for the first 12 bytes. *length* is the total length of the packet excluding CRC.

start-fg

Usage:

```
start-fg <dport> <count> <rate>
```

This command starts frame generation. *dport* is a hex bitmap of ports on which to generate traffic. For example, a *dport* of 3E will send frames to ports 2,3,4,5,6. *count* specifies the number of frames to send on each interface. A *count* of 0 specifies an infinite number of packets. *rate* specifies the number of packets per second to generate.

stop-fg

This command stops the Ethernet frame generator.

IP Commands

This section lists the IP Configuration commands available to the command line interface. It is separated into different sections to allow simpler lookup: IP Configuration lists general configuration commands, Ping lists commands pertaining to the ping ability of the Agent, Address Resolution Protocol lists pertinent features.

IP Configuration

get-ip

This command shows the device's current IP address, if any.

```
SYS_console> get-ip      -- no IP Config defined
 The device has no IP Address defined
SYS_console> _

SYS_console> get-ip      -- IP Config already defined
 The device IP address is: 129.001.001.064
SYS_console> _
```

set-ip

Usage:

`set-ip <IPaddress>`

Sets the IP address of the SNMP Agent. If no IP address was previously set (as is the default factory configuration), the new value will be used immediately and saved into NVRAM. Otherwise the new value will only be stored in the NVRAM, and the user must execute a "warm-reset" to effect the change.

get-ip-cfg

This shows the complete current IP configuration - address, network mask and broadcast address.

```
SYS_console> get-ip-cfg  -- no address defined
 The device has no IP Address defined
SYS_console>

SYS_console> get-ip-cfg  -- address previously defined
 The device IP address, netmask and broadcast are:
            IP address   : 129.001.001.064
            IP netmask   : 255.255.255.000
            IP broadcast : 129.001.001.000
```

set-ip-cfg

Usage:

`set-ip-cfg <IPaddress> <netmask> <broadcast>`

Sets IP address, network IP address and broadcast IP address. If no IP configuration was previously set (as is the default factory configuration), the new values will be used immediately and saved into NVRAM. If a previous IP configuration was being used, the new configuration will be saved in NVRAM for the next session. In order to use the newly defined values immediately, reset the system using the "warm-reset" command.

NOTE *If the IP configuration is not specified, the agent will not respond to any in-band requests, including ping messages.*

-- No IP Config. defined

```
SYS_console> set-ip-conf 129.1.1.64 255.255.255.0 129.1.1.0
  Device IP Address set for this session
  Device IP Address change in the NVRAM OK
The device IP configuration in the next session will be:
            IP address   : 129.001.001.064
            IP netmask   : 255.255.255.000
            IP broadcast : 129.001.001.000
```

-- IP Config. already defined

```
SYS_console> set-ip-conf 129.1.1.67 255.255.255.0 129.1.1.0
  Device IP Address unchanged for this session
  Device IP Address change in the NVRAM OK
  The device IP configuration in the next session will be:
            IP address   : 129.001.001.067
            IP netmask   : 255.255.255.000
            IP broadcast : 129.001.001.000
SYS_console> _
```

clear-ip-cfg

This command clears the IP configuration in the NVRAM.

get-gatew

Shows default gateway. This command shows which default route will be used to access a different IP network.

set-gatew

Usage:

set-gatew *<IPaddress>*

Sets the default gateway IP Address. This command lets you specify the address of the router used to access a different IP network. The default value for the default gateway IP address is 0.0.0.0

```
SYS_console> set-gatew 129.1.1.1
 Device Default Gateway change in the NVRAM OK
 Device Default Gateway changed to : 129.1.1.1

SYS_console> get-gatew
 Device default gateway address is : 129.001.001.001
SYS_console> _
```

get-arp-tbl

Shows ARP table. The ARP table contains information relating IP addresses to MAC addresses and interface numbers.

```
SYS_console> get-arp-tbl

IfIndex      IpAddress              MAC Address
=========================================================
    1      129.001.001.001         00-40-05-2D-73-9C
SYS_console> add-arp-entry 129.1.1.200 00-40-05-2b-59-ea 1
 ARP Table Entry successfully added
SYS_console> get-arp-tbl

IfIndex      IpAddress              MAC Address
=========================================================
    1      129.001.001.001         00-40-05-2D-73-9C
    1      129.001.001.200         00-02-A0-D4-9A-57
SYS_console> del-arp-entry 129.1.1.200
 ARP Table Entry with IP Address <129.1.1.200> removed
SYS_console> get-arp-tbl

IfIndex      IpAddress              MAC Address
=========================================================
    1      129.001.001.001         00-40-05-2D-73-9C
SYS_console> _                              Host 129.1.1.1 is
```

add-arp-entry

Usage:

```
add-arp-entry <IPaddress> <mac_address> <Interface>
```

Add entry to ARP table.

del-arp-entry

Usage:

```
del-arp-entry {<IPaddress>|*}
```

Deletes entries from the ARP table. If an IP address is specified, the matching arp entry will be deleted. If * is specified, the entire ARP table will be flushed. This command should be used if the network topology has physically changed, e.g. if a management station has been moved from one segment to another, thus changing its interface number.

get-bootp

This command retrieves the current state of the BOOTP process.

set-bootp

Usage:

```
set-bootp {enable|disable}
```

This command enables or disables BOOTP.

Ping

```
Usage:
  ping <IPaddress> {<number>|0}
```

Ping IP *address number* times or 0 for endless ping. The ping process starts sending one datagram per second until *number* datagrams are sent. It prints one line of output for every response that it receives. The ping command does not return any output if there is no response. Normal response time is 1 to 10 seconds.
The ping command is intended for testing the connectivity between the switch and an IP station. It is not intended as a traffic generator. Thus, using the endless ping option is not recommended.

If you started a “long” ping, issue a ping-stop command to stop it.

-- successful ping of a reachable host

```
SYS_console> ping 129.1.1.1 10  4
SYS_console>
```

Use CTRL-C or ping-stop to stop the ping process.

```
192.168.001.002 Alive. echo reply: id 2652, seq 1, echo-data-len 0
192.168.001.002 Alive. echo reply: id 2652, seq 2, echo-data-len 0
129.068.001.002 Alive. echo reply: id 2652, seq 3, echo-data-len 0
 PING process stopped - statistics:
   ICMP echo requests     :       3
   ICMP echo responses    :       3
PING process  -  press <CR> for prompt
```

-- unsuccessful ping of a host (*)

```
SYS_console>
  SYS_console> ping 129.1.1.88 2 4
SYS_console> _
```

If the host does not respond, the console prompt is printed and no output is added. Failure to get an echo response from a host may be due to:

- A bad physical connection
- A non-existent or inactive host
- Network Unreachable: no corresponding entry in the routing table
- Destination Unreachable: the default gateway failed to route the datagram
- Outdated ARP table information - flush the ARP table with the **`del-arp-entry`** command.

If there is an active ping process due to a previous “long” ping command and you try to start a new ping, the command fails and an error message is displayed.

For example, start an endless ping to an unreachable host. No response will be received. Now try to ping an existing host. The second ping will fail because the first one is still active. The solution is to use the ping-stop command to stop the first active ping process.

```
          -- host 129.1.1.1 reachable
SYS_console> ping 129.1.1.1 1
SYS_console>
              Use ping-stop to stop the ping process

129.001.001.001 Alive. echo reply: id 297, seq 1, echo-data-len 8
 PING process stopped - press <CR> for prompt
SYS_console> ping 129.1.1.88 0
SYS_console> ping 129.1.1.1 1
 A ping process is active - can't start another one
SYS_console> ping-stop

          -- host 129.1.1.1 reachable
SYS_console> ping 129.1.1.1 1
SYS_console>
              Use CTRL-C or ping-stop to stop the ping process
129.001.001.001 Alive. echo reply: id 297, seq 1, echo-data-len 8
 PING process stopped - press <CR> for prompt
SYS_console> _
```

ping-stop

Stop the active ping process.

get-def-ttl

This command returns the running default IP Time To Live value. This value (between 1 and 255) is the number of seconds this frame will be kept alive by router along its path.

set-def-ttl

`Usage:`

`set-def-ttl <number>`

This command modifies the default Time To Live value. *number* (between 1 and 255) will be used as the new value.

SNMP Commands

This chapter contains a description of the commands available under the Administrative Interface to set and display the SNMP Agent IP and SNMP parameters and databases.

SNMP Community String Commands

SNMP Community strings authenticate access to the Management Information Base (MIB). Community strings function as “passwords” embedded in every SNMP packet. The community string must match one of the two community strings configured in the switch for the message to be processed. There are two community strings, one for each of the following types of accesses:

- read - mode gives read access to all the objects in the MIB, but does not allow write access
- write - mode gives read and write access to all objects in the MIB

get-comm

```
Usage:
  get-comm {read|write|*}
```

This command displays the SNMP community string for a given access mode (read or write). If the access mode is specified as *, both the read and the write community strings are displayed.

```
SYS_console> get-comm *
 Current read  community is: < public >
 Current write community is: < private >
```

set-comm

```
Usage:
  set-comm {read|write} <community-string>
```

This command lets you specify the SNMP community string for each of the two access modes: read and write.

```
SYS_console> set-comm write password
New write community is: < password >
```

SNMP Trap Message Commands

When the Switch detects an extraordinary event, it generates a trap. A trap is a notification message that may be sent to predefined Network Manager Stations. A trap event may be a reset (cold or warm), detection of an interface link status change, an SNMP authentication failure due to an incorrect community string, etc.

The SNMP trap commands let you manage:

- Whether or not the MegaSwitch issues an authentication trap
- The list of selected Network Manager Stations to which the switch-generated traps will be sent by the SNMP agent. The list has a maximum capacity of five entries.

get-auth

Displays the Authentication Trap mode: enabled or disabled.

set-auth

```
Usage:
  set-auth {on|off}
```

This command allows the user to modify the Authentication Trap mode. The default value is on, meaning that the switch will generate authentication traps. Changing the mode to off will cause the switch to avoid sending authentication traps.

get-traps

Displays the list of traps-receiving stations: their IP address and trap SNMP community string.

```
SYS_console>get-traps
            SNMP TRAP TABLE
            ===============

   IPADDR                          COMMUNITY
 ------------------------------------------------
 192.168.001.065   -----------     testing
 ------------------------------------------------
```

add-trap

Usage:

```
  add-trap <IPaddress> <trap-community>
```

The add-trap command enters the IP Address of the receiving station and the trap community string that will appear in the trap message.

```
SYS_console> add-trap 129.1.1.76 rnd
 Entry 129.1.1.76 - rnd added
            SNMP TRAP TABLE
            ===============

   IPADDR                          COMMUNITY
 ____________________________
 129.001.001.065   ------      public
 129.001.001.007   ------      trapcomm
 129.001.001.076   ------      rnd
 ____________________________
```

del-trap

Usage:

```
  del-trap <IPaddress>
```

The del-trap command can be used to remove a station from the trap table. The station IP address must be provided.

```
SYS_console> del-trap 129.1.1.7
 Entry 129.1.1.7 - trap comm deleted
```

Switching Database Commands

This section contains instructions for managing the Switching Database with the Administrative Interface.

The Switching Database consists of 1024 or 2048 entries, depending on the Switch model. Each active entry contains the information relevant to a workstation, characterized by its Ethernet MAC Address. Each entry contains the following information:

- lock

If on (denoted as a +), the entry will not be deleted by the switch aging process (static entry). If off (denoted as a -), this is a dynamic entry that may be automatically deleted by the switch aging process if the workstation is not active during an aging time period

- self (not user configurable)

If on (denoted as a +), the entry is a system address. Such addresses are the switch’s individual and group addresses, as well as other addresses added by the management system. If off (denoted as a -), the entry contains the MAC address of a station on the connected network.

- dport

The destination port to which frames with the stated address will be forwarded. Only applied if the address is not a custom filter.

- The MAC Address contained in an entry or given as a parameter is printed as a 6 byte, hexadecimal sequence, separated by the “-” sign, e.g.

  `00-20-1A-00-01-29.`

- The index contained in the following commands is an integer number between 1 and the maximum size of the Switching Database Table (1024 or 2048).

The first section, Virtual Addresses, lists commands relevant to standard MAC Addresses, such as determining the behavior of the switch when presented with a particular address. The second section, Custom Filtering, lists commands pertinent to the Custom Filtering capabilities of the XM59x.

get-sport-hex

```
  Usage:
get-sport-hex < port_list>
```

This command converts a list of ports to hexadecimal format for use in the add-cf-entry or del-cf-entry commands as the sport paramater. See the Port Grouping Commands section for details on the format of the port_list parameter.

get-dport-hex

```
Usage:
  get-dport-hex < port_list>
```

This command converts a list of ports to hexadecimal format for use in the add-cf-entry command as the dport paramater. See the Port Grouping Commands section for details on the format of the port_list parameter.

get-lt-age

Displays the Switching Database Aging Time in seconds. The Aging Time is the time-out period for aging out dynamically learned forwarding information entries. An entry whose MAC address does not appear in the source field of an incoming packet for a period equal to the Aging Time is discarded. The default value for the Aging Time is 300 seconds.

set-lt-age

`Usage:`

`set-lt-age {run|nvram|all} <`*`aging_time`*`>`

Lets the user modify the Switching Database Aging Time. The change may be made:

- In the running database so that the new value is used immediately.
- In the NVRAM, meaning that the change will occur only in the next session.
- In both the running and the NVRAM databases.

The `aging_time` is in seconds. The factory default value is 300 seconds. Use a lower value if the number of active workstations at a given moment is larger than the size of the Switching Database. The aging time can be anywhere between 1 and 55,000 seconds.

Virtual Addresses

get-lt-entry

```
Usage:
  get-lt-entry <index>
```

Displays the entry at *<index>* in the Switching Database.

```
SYS_console> get-lt-entry 19
 Entry  -- MAC Address --          LOCK  SELF    DPORT   MGMT
================================================================
   19    00-20-C5-00-59-E6          -     -       14       -
```

The entry described is:

• Entry number 19

• MAC Address 00-20-C5-00-59-E6

• Is not a static entry, i.e. it will be aged out (lock is off)

• Is not a system address (self is off)

• The frame will be forwarded only to port 14

• The frame will not be forwarded to the management port (mgmt is OFF)

get-lt-16

```
Usage:
  get-lt-16 {<index>|*}
```

Displays 16 learn table entries starting at *<index>*, or "*" to continue from the last displayed index. The format of the display is similar to the previous command format. If the end of the learn table is reached, the * parameter will start the list over from the beginning.

```
SYS_console>get-lt-16 10
 Entry ---- MAC Address ----     LOCK           SELF            DPORT   MGMT
================================================================
  10     00-20-1A-20-20-D9       +               +             -CUSTOM FILTER-
  11     00-20-1A-24-20-D9       +               +             -CUSTOM FILTER-
  12     00-20-1A-28-20-D9       +               +             -CUSTOM FILTER-
  13     00-20-1A-2C-20-D9       +               +             -CUSTOM FILTER-
  14     00-20-1A-30-20-D9       +               +             -CUSTOM FILTER-
  15     00-20-1A-34-20-D9       +               +             -CUSTOM FILTER-
  16     00-20-1A-38-20-D9       +               +             -CUSTOM FILTER-
  17     FF-FF-FF-FF-FF-FF       +               -             -CUSTOM FILTER-
  18     00-40-05-2D-9D-49       -               -               3       -
  19     00-20-C5-00-59-E6       -               -               14      -
  20     00-00-92-94-01-54       -               -               1       -
  21     00-C0-1D-01-06-20       -               -               1       -
  22     00-40-05-2B-0A-26       -               -               13      -
  23     00-40-05-29-1E-DE       -               -               4       -
  24     00-40-05-2B-17-37       -               -               4       -
  25     08-00-20-76-72-89       -               -               2       -
  SYS_ console> _
```

```
SYS_console>get-lt-16 *
Entry ---- MAC Address ----     LOCK            SELF          DPORT     MGMT
================================================================
26       00-40-05-11-06-AD      -                -             14        -
27       00-40-05-2B-59-EA      -                -             3         -
28       00-40-05-2D-99-3A      -                -             7         -
29       00-40-05-16-80-7C      -                -             5         -
30       00-00-C0-60-A7-B9      -                -             5         -
31       00-40-05-1A-A1-69      -                -             5         -
32       00-40-05-29-1E-EB      -                -             12        -
33       00-40-05-2E-DF-15      -                -             5         -
34       00-40-05-28-B4-1A      -                -             7         -
35       00-40-05-2F-93-A7      -                -             4         -
36       00-40-33-32-A6-58      -                -             14        -
37       00-40-05-15-70-5E      -                -             5         -
38       00-40-05-1A-A1-5F      -                -             12        -
39       00-40-05-28-B7-2A      -                -             5         -
40       00-40-05-2B-16-3D      -                -             12        -
41       00-40-05-15-B6-83      -                -             4         -
SYS_ console> _
```

Note that the first few entries belong to the system. These entries contain important information related to the SNMP Agent and should never be modified or removed by the user.

Also note that entries 18 and onwards are self-learned MAC addresses, as indicated by the lock = OFF and by self = OFF. These entries were each learned from the port stated in the DPORT field.

find-lt-addr

```
Usage:
  find-lt-addr <mac_address>
```

Search for a MAC address in the learn table. If *mac_address* is found in the Switching Database, an entry description as in the previous commands is displayed:

```
SYS_console>find-lt-addr 00-40-05-2B-16-3D
 Entry  ---- MAC Address ----  LOCK   SELF    DPORT     MGMT
=======================================================
   40     00-40-05-2B-16-3D     -      -       12        -
SYS_console> _
```

If the requested MAC address is not in the learn table, an error message is displayed:

```
SYS_console> find-lt-addr 00-40-05-2b-59-66
  MAC Address - 00-40-05-2b-59-66 - not in LT
SYS_console> _
```

address already deleted

del-lt-entry

Usage:

```
del-lt-entry <index>
```

Deletes the learn table entry at *<index>*. If the entry delete was successful or if the entry is not ACTIVE, then the command will be successful.

Deleting entries with the self field set is prohibited since they are system addresses.

The del-lt-entry command is very powerful, allowing the user to change the entire Switching Database with the exception of the System MAC Address. Therefore, it should be used with caution.

```
 SYS_console> del-lt-entry 15
   Deleting entry at index - 15 - OK
SYS_console> del-lt-entry 16
   Deleting entry at index - 16 - OK
SYS_console> del-lt-entry 1
   Deleting entry at index - 1 - failed
SYS_console> del-lt-entry 2
   Cannot delete a System Address Deleting entry at index - 2 - failed
SYS_console> _
```

del-lt-addr

Usage:

```
del-lt-addr <mac_address>
```

Deletes the learn table entry that matches mac_address.

The command fails if *mac_address* is not found in the learn table. Again, as in the previous command, caution should be employed when deleting system entries (self=ON).

```
SYS_console> del-lt-addr 00-40-05-2b-59-4c
   Deleting entry with MAC address - 00-40-05-2b-59-4c OK
SYS_console> del-lt-addr 00-40-05-2b-59-4c
   MAC Address - 00-40-05-2b-59-4c - not in LT
SYS_console> _
```

add-lt-entry

Usage:

```
add-lt-entry <mac_address> {lock-on|lock-off} <dport>
```

Add a learn entry to the Switching Database. The commands parameters are described at the beginning of this chapter.

Note that *dport* is a decimal number representing the number of the destination port.

Custom Filtering Commands

The custom filter entry for an address is shown on the screen as a matrix, in the following format:

Here the SRC column lists the available source ports (1 through the number of ports on the switch). Each of the other columns represents an available destination port. If a + mark is encountered, it represents a forwarding path. For example, as displayed below, each source port (with the exception of port 3) will forward this frame to port 3.

```
SYS_console> get-lt-filter 00-20-1A-00-0A-5C
  2      00-20-1A-00-0A-5C LOCK_ON     SELF_ON --- CUSTOM FILTER -----
SRC PORT to : MGMT  P1  P2  P3  P4  P5  P6  P7  P8  P9  P10  P11  P12
=====================================================================
    1         -    -   -   +   -   -   -   -   -   -   -    -    -
    2         -    -   -   +   -   -   -   -   -   -   -    -    -
    3         -    -   -   +   -   -   -   -   -   -   -    -    -
    4         -    -   -   +   -   -   -   -   -   -   -    -    -
    5         -    -   -   +   -   -   -   -   -   -   -    -    -
    6         -    -   -   +   -   -   -   -   -   -   -    -    -
    7         -    -   -   +   -   -   -   -   -   -   -    -    -
    8         -    -   -   +   -   -   -   -   -   -   -    -    -
    9         -    -   -   +   -   -   -   -   -   -   -    -    -
    10        -    -   -   -   -   -   -   -   -   -   f    -    -
    11        -    -   -   -   -   -   -   -   -   -   -    -    -
    12        -    -   -   -   -   -   -   -   -   -   -    -    -
```

get-lt-filter

Usage:

```
get-lt-filter <mac_address>
```

This command retrieves the Learn Table filter for the specified MAC Address. See above for an example.

add-cf-entry

Usage:

```
add-cf-entry {lock-on|lock-off|perm} <mac_address> <sport> <dport>
```

This command adds a custom filter learn table entry for the hardware address *mac_address*. lock-on indicates that the entry will not be aged out, but will be lost upon reset. lock-off indicates that the entry can be aged out normally. perm indicates the filter will be written to NVRAM and restored upon reset. *sport* is a hexadecimal bitmask of incoming ports (bit 0 is port 1, bit 1 is port 2...), and *dport* is a hexadecimal bitmask of outgoing ports (bit 0 is the management port, bit 1 is port 1...). Packets arriving at the switch with *mac_address* destination address from any port specified in *sport* will be transmitted to all ports specified in *dport*. For example:

```
SYS_console> add-cf-entry lock-on 00-00-00-11-11-11 62 108
  Add CF LT entry OK
  CF Entry Update in NVRAM OK
SYS_console> _
```

will send packets with destination MAC address 00-00-00-11-11-11 from source ports 2, 6 and 7 (62 in hex is 0 1 1 0 0 0 1 0 in binary) to destination ports 3 and 8 (108 in hex is 1 0 0 0 0 1 0 0 0 in binary). All other ports receive a value of 00, meaning that they are filtered. For example, a packet with MAC address 00-00-00-11-11-11 with a source port other than sport will be filtered, unless there was a previous filter for this MAC address and source port.

For example, you may check the above custom filter entry with the get-lt-filter command:

```
SYS_console> get-lt-filter 00-00-00-11-11-11
   69     00-00-00-11-11-11  LOCK_ON   SELF_OFF --- CUSTOM FILTER -----
SRC PORT to : MGMT  P1  P2  P3  P4  P5  P6  P7  P8  P9  P10 P11 P12
==========================================================================
    1           -   f   -   -   -   -   -   -   -   -   -   -   -
    2           -   -   -   +   -   -   -   -   +   -   -   -   -
    3           -   -   -   f   -   -   -   -   -   -   -   -   -
    4           -   -   -   -   f   -   -   -   -   -   -   -   -
    5           -   -   -   -   -   f   -   -   -   -   -   -   -
    6           -   -   -   +   -   -   -   -   +   -   -   -   -
    7           -   -   -   +   -   -   -   -   +   -   -   -   -
    8           -   -   -   -   -   -   -   -   f   -   -   -   -
    9           -   -   -   -   -   -   -   -   -   -   -   -   -
   10           -   -   -   -   -   -   -   -   -   -   -   -   -
   11           -   -   -   -   -   -   -   -   -   -   -   -   -
   12           -   -   -   -   -   -   -   -   -   -   -   -   -
SYS_console>
```

del-cf-entry

Usage:

```
del-cf-entry {run|nvrun} <mac_address> <sport>
```

This command deletes the custom filter learn table entry for address *mac_address* from source port *sport*. The run option indicates that the entry will only be deleted from the current running table. nvrun indicates that the entry should be removed from the non-volatile memory as well as from the current running table.

get-nv-cftbl

Usage:

```
get-nv-cftbl
```

This command displays the Custom Filter table stored in non-volatile memory.

```
NVRAM CUSTOM FILTERS TABLE
==============================
       Entry ---- MAC Address ----
------------------------------
       1      00-00-00-11-11-11
SYS_console>
```

get-nv-cfilt

Usage:

```
get-nv-cfilt <mac_address>
```

This command retrieves the Custom Filter associated with mac_address from the Custom Filter table stored in non-volatile memory.

Virtual LAN Commands

Virtual LANs can be used to limit the broadcast domain and to establish virtual workgroups.

- **run** indicates that only the currently running configuration is changed. Changes are not restored after a reset.
- **nvram** indicates that only the configuration stored in non-volatile memory is changed. Changes will not take effect until a reset.
- **all** indicates that both the currently running configuration and the non-volatile configuration is changed. Changes will take effect immediately and will be restored after a reset.

get-con-matrix

Retrieve the current connectivity matrix for the switch. A table similar to the one displayed above (Custom Filters) is displayed. Here, the first column is the source port. The other columns are destinations to which frames from a given source port (determined by which row) may be forwarded. Unlearned addresses will be forwarded to all destinations marked with a + in the source port's row. Learned addresses will be forwarded to their destinations only if the destination is marked with a + in the source port's row. Filtered ports are marked with f.

```
SYS_console> get-con-matrix
  VLAN CONNECTIVITY MATRIX
=========================
SRC PORT to :    P1  P2  P3  P4  P5  P6  P7  P8   P9  P10  P11  P12
=============================================================
   1             -   +   +   -   +   +   +   +    -   -    -    -
   2             +   -   +   -   +   +   +   +    -   -    -    -
   3             +   +   -   -   +   +   +   +    -   -    -    -
   4             -   -   -   f   -   -   -   -    -   -    -    -
   5             +   +   +   -   -   +   +   +    -   -    -    -
   6             +   +   +   -   +   -   +   +    -   -    -    -
   7             +   +   +   -   +   +   -   +    -   -    -    -
   8             +   +   +   -   +   +   +   -    -   -    -    -
   9             -   -   -   -   -   -   -   -    -   -    -    -
   10            -   -   -   -   -   -   -   -    -   -    -    -
   11            -   -   -   -   -   -   -   -    -   -    -    -
   12            -   -   -   -   -   -   -   -    -   -    -    -
SYS_ console>
```

get-vbc-matrix

Retrieve the current broadcast domain matrix for the switch. See above for a description of the resulting table. Here, though, only the broadcast address will be affected.

```
SYS_console> get-vbc-matrix
  VBC CONNECTIVITY MATRIX
=========================
SRC PORT to :    P1  P2  P3  P4  P5  P6  P7  P8   P9  P10  P11  P12
=============================================================
   1             -   +   +   -   +   +   +   +    -   -    -    -
   2             +   -   +   -   +   +   +   +    -   -    -    -
   3             +   +   -   -   +   +   +   +    -   -    -    -
   4             -   -   -   f   -   -   -   -    -   -    -    -
   5             +   +   +   -   -   +   +   +    -   -    -    -
   6             +   +   +   -   +   -   +   +    -   -    -    -
   7             +   +   +   -   +   +   -   +    -   -    -    -
   8             +   +   +   -   +   +   +   -    -   -    -    -
   9             -   -   -   -   -   -   -   -    -   -    -    -
   10            -   -   -   -   -   -   -   -    -   -    -    -
   11            -   -   -   -   -   -   -   -    -   -    -    -
   12            -   -   -   -   -   -   -   -    -   -    -    -
SYS_ console>
```

set-vbc-domain

Usage:

```
set-vbc-domain {run|nvram|all} <port_list>
```

This command establishes a Virtual broadcast domain. `port_list` is a dash-separated list of ports to group into a broadcast domain. For example:

```
set-vbc-domain all 2-5-6-7
```

will create a virtual broadcast domain of ports 2, 5, 6, and 7.

del-vcb-domain

Usage:

```
del-vbc-domain {run|nvram} <domain_id>
```

This command deletes a virtual broadcast domain, as identified by get-vbc-tbl.

get-vcb-tbl

Usage:

```
get-vbc-tbl {run|nvram}
```

This command retrieves the list of defined virtual broadcast domains.

```
SYS_console> get-vbc-tbl run
  RUNTIME        VIRTUAL BROADCAST DOMAIN TABLE
=========================================
   VBC ID         P1  P2  P3 P4  P5  P6 P7  P8  P9 P10  P11  P12
============================================================
   1:             -   -   -  +   +   +  -   -   -  -    -    -
SYS_ console>
```

set-sec-vlan

Usage:

```
set-sec-vlan {run|nvram|all} <port_list>
```

This command establishes a Security Virtual LAN. The arguments are identical to set-vbc-domain. The ports in a Virtual LAN are only allowed to send and receive packets from other ports in the same Virtual LAN.

del-sec-vlan

Usage:

```
del-sec-vlan {run|nvram} <lan_id>
```

This command deletes the Virtual LAN specified by *lan_id*.

get-svlan-tbl

Usage:

```
get-svlan-tbl {run|nvram}
```

This command shows the table of defined Virtual LANs.

```
SYS_console> get-svlan-tbl run
 RUNTIME    SECURITY VIRTUAL LANs TABLE
  ========================

  SVLAN ID   P1  P2  P3  P4  P5  P6  P7  P8  P9  P10 P11 P12
  ============================================================
    1:        +   -   +   -   +   -   -   -   -   -   -   -
    2:        +   +   -   -   -   -   +   -   -   -   -   -
SYS_console>
```

set-isvlan

Usage:

`set-isvlan {run|nvram|all} < port_list> < tag> < name>`

This command establishes a Virtual LAN. The first two arguments are identical to set-vbc-domain. The ports in a Virtual LAN are only allowed to send and receive packets from other ports in the same Virtual LAN. You must include at least one trunk port (see the **set-isvp-mode** command) in the Virtual LAN, and there can be no sharing of ports, like in Security Virtual LANs. The <*tag*> parameter sets an identifier for the VLAN. This number must uniquely identify the VLAN to all devices on the network. The <name> parameter is simply a string (up to 15 characters) to identify the VLAN. `Names` can be duplicate, but `Tags` cannot. `tag` can take any value from 2 to 255. Values 1 and 0 are reserved by the system.

Adding an ISVLAN will cause the switch to add an SVLAN, if necessary, so the **get-svlan-tbl** command will reflect the new changes. In addition, an SVLAN created by an ISVLAN cannot be deleted (except by deleting the appropriate ISVLAN).

del-isvlan

Usage:

`del-isvlan {run|nvram} < lan_id>`

This command deletes the Virtual LAN specified by lan_id . In addition, if necessary, the SVLAN associated with this ISVLAN will be deleted. If the SVLAN was created directly through the set-sec- vlan command, then it will remain in the system until deleted by the del-sec-vlan command.

get-isvlan-tbl

Usage:

`get-svlan-tbl {run|nvram}`

This command shows the table of defined Virtual LANs.

```
SYS_console> get-isvlan-tbl run
 RUNTIME  InterSwitch Virtual LAN Table:
  VID TAG SVID      NAME        1  2  3  4  5  6  7  8  9  10 11 12
  ===========================================================================
    1   4   1             toddr +  +  +  +  -  -  -  -  T  -  -  -
SYS_console>
```

Here, the VID is the `lan_id` in the database (for use in the **del-isvlan** command). TAG is the `tag` parameter used in the **set-isvlan** command. SVID is the number of the Security Virtual LAN associ- ated with this ISVLAN; which will contain the same ports as the SVLAN ID number listed after the **get-svlan-tbl** command. NAME is the `name` parameter used in the **set-isvlan** command. Finally, the ports which are contained in this VLAN are listed, with a T used to represent a port in trunk mode.

Port Monitoring

set-mon-port

```
Usage:

  set-mon-port <port>
```

This command sets the port to be monitored. *port* is a decimal port number. All traffic from this port will be duplicated on the monitoring port specified by the monitor command.

monitor

```
Usage:

  monitor <port>
```

This command sets the monitoring port. All traffic from the port specified by **set-mon-port** will be duplicated on *port. port* is a decimal port number.

stop-mon

This command ends port monitoring.

get-nv-mon

This command retrieves the port monitoring information stored by the **save-mon** command in the NVRAM.

save-mon

This command saves the current port monitoring information (including **set-mon-port** and **monitor** commands) into the NVRAM, so that the monitoring will be restarted upon device reset.

clear-nv-mon

This command clears the port monitoring information previously stored in the NVRAM with the **save-mon** command.

Spanning Tree Commands

Spanning Tree automatically configures a loop-free topology in a bridged environment. The Spanning Tree agent is implemented in conformance to the IEEE 802.1d standard. Listed below are the configuration commands pertinent to the operation of the Spanning Tree algorithm.

get-stp

Retrieve the current state of Spanning Tree. Options are enable or disable.

set-stp

```
Usage:

  set-stp {enable|disable}
```

This command enables or disables the Spanning Tree protocol. Spanning Tree is enabled by default, in accordance with 802.1d. Enabling or disabling Spanning Tree will not take effect until the SNMP agent is reset, via **warm-reset**, **cold-reset** or a power cycle.

get-st-bcfg

This command retrieves the Spanning Tree bridge parameters. If Spanning Tree is disabled, no parameters will be retrieved.

get-st-syscfg

This command retrieves the Spanning Tree state of all the ports.

get-st-pcfg

This command retrieves the Spanning Tree port parameter table. If Spanning Tree is disabled, no parameters will be retrieved.

set-st-pcfg

```
Usage:

set-st-pcfg < port_list> < command> < param>
```

This command sets any Spanning Tree port configuration. The `port_list` parameter is a list of ports (as specified in the Port Grouping Commands section). `command` can be one of: prio, enb, or pcost.

`param` is a parameter to send to the appropriate command:

command	param	meaning
`enb`	`enable`	enable all the ports in `port_list`
	`disable`	disable all the ports in `port_list`
`prio`	`number`	set the port priority of all the ports in `port_list` to number
`pcost`	`number`	set the port path cost of all the ports in `port_list` to number

For **pcost**, the range of `number` is between 0 and 65535. For **prio**, the range of `number` is between 0 and 255. See the commands, s**et-prt-enb, set-prt-prio,** and **set-prt-pcost** for further details.

set-br-prio

```
Usage:

  set-br-prio <priority>
```

This command sets the Spanning Tree bridge priority of the Switch. `priority` is an integer in the range 0..65535. This is equivalent to setting the MIB variable dot1dStpPriority (RFC 1493).

set-br-maxage

```
Usage:

  set-br-maxage <maxage>
```

This command sets the Spanning Tree bridge MaxAge. This is the amount of time between Spanning Tree configuration messages. Note that `maxage` is in units of seconds in the range 6..40, while the corresponding MIB variable, dot1dStpBridgeMaxAge (RFC 1493), is in units of hundreths of a second, in the range 600..4000, and must be a multiple of 100.

set-br-hellot

```
Usage:

  set-br-hellot <hello_time>
```

This command sets the Spanning Tree bridge Hello Time. `hello_time` is an integer in the range 1..10. Note that `hello_time` is in units of seconds, while the corresponding MIB variable, dot1dStpBridgeHelloTime (RFC 1493), is in units of hundreths of seconds in the range 100..1000, and must be a multiple of 100.

```
  SYS_console> set-br-hellot 2

     The Bridge Hello Time was changed

  SYS_console>
```

set-br-fwdel

```
Usage:

  set-br-fwdel <forward_delay>
```

This command sets the Spanning Tree bridge Forward Delay. This controls the amount of time between the listening and forwarding Spanning Tree states, and is completely unrelated to the forwarding latency. Note that `forward_delay` is an integer in units of seconds in the range 4..30, while the corresponding MIB variable, dot1dStpBridgeForwardDelay (RFC 1493), is in units of hundreths of seconds in the range 400..3000, and must be a multiple of 100.

set-prt-prio

```
Usage:

  set-prt-prio <port_number> <port_priority>
```

This command sets the Spanning Tree port priority. `port_number` is the decimal port number, and `port_priority` is an integer in the range 1..255. This is equivalent to setting the MIB variable dot1dStpPortPriority (RFC 1493).

set-prt-enb

```
Usage:

  set-prt-enb <port_number> {enable|disable}
```

This command enables or disables a port in the Spanning Tree. `port_number` is the integer port number. This is equivalent to setting the MIB variable dot1dStpPortEnable (RFC 1493).

set-prt-pcost

```
Usage:

  set-prt-pcost <port_number> <path_cost>
```

This command sets the Spanning Tree port path cost. `port_number` is the integer port number, and `path_cost` is an integer path cost in the range 1..65535. This is equivalent to setting the MIB variable dot1dStpPortPathCost (RFC 1493).

Port Configuration Commands

This chapter contains instructions for configuring and displaying the ports' parameters with the Administrative Interface.

get-port-cfg

The get-port-cfg command displays the current port configuration.

```
SYS_console> get-port-cfg
 PORT_ID   LAN_TYPE  LINK  IF_TYPE  SPEED_SEL  LAN_SPEED   FDPLX  FCTRL
 =======  ========  ====  =======  =========  =========  =====  =====
   1       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   2       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   3       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   4       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   5       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   6       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   7       ETH10/100  OFF   TPFD     ASENSE     100Mbps    OFF    ON
   8       ETH10/100  ON    TPFD     ASENSE     100Mbps    OFF    ON
   9       ETH10/100  ON    TPFD     ASENSE     100Mbps    OFF    ON
  10       ETH10/100  ON    TPFD     ASENSE     100Mbps    OFF    ON
  11        NONE      ---- PORT NOT INSTALLED ----
  12        NONE      ---- PORT NOT INSTALLED ----
SYS_console>
```

The information displayed contains:

- An interface number
- LAN type: ETH-10 indicates 10 Mbps Ethernet
- Link status: ON/OFF
- Physical Interface Type: AUI , TP , AUI-TP (AUI & TP), etc.
- Physical Interface selected: AUI or TP(default)
- Full Duplex mode:
  OFF = Standard Ethernet (default), ON = Full Duplex
- Flow Control: (has no effect if Full Duplex is enabled)
  ON = enabled (default), OFF = disabled

set-port-cfg

`Usage:`

`set-port-cfg < port_list> < command> < param>`

This command sets any port configuration. The `port_list` parameter is a list of ports (as specified in the Port Grouping Commands section). `command` can be one of: dplex, fctrl, speed, isvp, or state. `param` is a parameter to send to the appropriate command: (see the other Port Configuration commands for further details).

command	param	meaning
`dplex`	`half`	set the ports in `port_list` to half-duplex
`dplex`	`full`	set the ports in `port_list` to full-duplex
`fctrl`	`off`	turns off flow control for all ports in `port_list`
`fctrl`	`on`	turns on flow control for all ports in `port_list`
`speed`	`10`	set the ports in `port_list` to 10Mbps mode
`speed`	`100`	set the ports in `port_list` to 100Mbps mode
`speed`	`asense`	set the ports in `port_list` to Autonegotiate mode
`isvp`	`trunk`	set the ports in `port_list` to ISVP trunk mode
`isvp`	`access`	set the ports in `port_list` to ISVP access mode
`state`	`enable`	enables all ports in `port_list`
`state`	`disable`	disables all ports in `port_list`

set-port-dplex

Usage:

```
set-port-dplex <port_number> {half|full}
```

The **set-port-dplex** command specifies if the given port will be active in full-duplex or in half-duplex (Standard Ethernet) mode. The default is half-duplex.

```
SYS_console> set-port-dplex 2 full
 Port configured in <full_duplex> mode
 Parameter change in NVRAM OK
SYS_console> _
```

NOTE *10Mbps, Full Duplex and Flow Control are mutually exclusive. Full Duplex Flow Control operation is only available on 100Mbps connections between two XM59x cards.*

set-speed-sel

Usage:

```
set-port-sel <port-number> {aui|tp|asel}
```

This command specifies if *port-number* will negotiate a 10Mbps or 100Mbps connection, or auto-select.

NOTES *If the switch is having difficulty auto-negotiating the wire speed, use this command to set the correct value.*

Asense and Full Duplex are mutually exclusive. You must choose a line speed before selecting Full Duplex.

set-port-fctrl

Usage:

```
set-port-fctrl <port-number> {on|off}
```

This command specifies if the given port will have the flow control feature enabled (on) or disabled (off). The default is flow control enabled (on).

If the port is in Full Duplex mode, the status of the flow control option has no effect, unless the connection is 100Mbps and both ports are on an XM59x. (See note above.)

```
SYS_console> set-port-fctrl 2 off
 Port 2 - flow control <off>
 Parameter change in NVRAM OK
SYS_console> _
```

set-port-state

Usage:

```
set-port-state < port-number> {enable|disable}
```

This command can be used to enable or disable a port when the Spanning Tree algorithm is not running. When Spanning Tree is running, **set-prt-enb** should be used instead.

set-isvp-mode

Usage:

```
set-isvp-mode < port-number> {trunk|access}
```

This command specifies if the given port will operate in ISVP trunk mode or in ISVP access mode. At least one port must be in ISVP trunk mode in order to add InterSwitch Virtual LANs (see **set-isvlan**).

get-isvp-mode

Usage:

```
get-isvp-mode < port-number>
```

This command retrieves the ISVP mode of the given `port-number`.

Switching Statistics Commands

This chapter contains instructions for displaying the switching statistics using the Administrative Interface. The following commands provide full physical layer information as well as inter-port switching statistics.

clr-cnt

This command clears the Ethernet and bridging counters.

get-eth-cnt

`Usage:`

```
get-eth-cnt <port-number>
```

This command displays the Ethernet Statistics Counters for port `port-number`. This is almost identical to the Ethernet-like Statistics Group of the Ethernet MIB.

```
SYS_console> get-eth-cnt 1
 Ethernet Statistics for port 1
 ==========================================
 Transmit    OK    :         0
 Underflow   Errors:         0
 Exces Coll  Errors:         0
 Exces Fctrl Errors:         0
 Receive     EOF   :    238559
 Receive     OK    :    238558
 Overflow    Errors:         0
 CRC         Errors:         1
 Alignment   Errors:         1
 Runt        Errors:         1
 Lost/Fctrl  Errors:         0
 Too Long    Errors:         0
 ==========================================
SYS_console> _
```

get-colls-cnt

`Usage:`

```
get-colls-cnt <port-number>
```

This command displays the Ethernet collision statistics for port `port-number`. This is almost identical to the Ethernet-like Collisions Statistics Group of the Ethernet MIB and shows the collision count distribution for this port.

```
SYS_console> get-colls-cnt 1
 Ethernet Collision Distribution for port 1
 ==========================================
  1 collision count :      2234
  2 collision count :       121
  3 collision count :         0
  4 collision count :         0
  5 collision count :         0
  6 collision count :         0
  7 collision count :         0
  8 collision count :         0
  9 collision count :         0
 10 collision count :         0
 11 collision count :         0
 12 collision count :         0
 13 collision count :         0
 14 collision count :         0
 15 collision count :         0
 16 collision count :         0
 ==========================================
SYS_console> _
```

get-rmon-cnt

```
Usage:
  get-rmon-cnt  <port>
```

Retrieve the RMON statistics group 1 counters for `port`.

get-sdist-cnt

```
Usage:
  get-sdist-cnt  <port>
```

Retrieve the RMON statistics packet size histogram for `port`.

get-br-cnt

```
Usage:
  get-br-cnt <port-number>
```

This command displays the Switching Statistics Counters for port `port-number`. The command displays:

- Number of packets/bytes received.
- Number of packets forwarded.
- Number of multicast packets.
- Number of packets with unknown destination and subsequently multicast.
- Number of packets transmitted.
- Number of packets lost (if flow control is disabled) or number of packets retransmitted by the originator due to the flow control (if flow control is enabled).
- Number of packets/bytes forwarded to port <n>. Note that if <n> equals <port-number> then the number of packets/bytes represents filtered frames.

```
SYS_console> get-br-cnt 1
 Ethernet Switching Counters for port 1
 ======================================================
 Frm   Received OK :          0
 Bytes Received    :          0
 Frm Filtered      :          0
 Frm to all ports  :          0
 Frm multicast     :          0
 Frm lost/fctrl    :          0
 Bytes Tr OK       :      22118

 Forward to port   :      FRAMES           BYTES
------------------------------------------------------
        1          :           0               0
        2          :           0               0
        3          :           0               0
        4          :           0               0
        5          :           0               0
        6          :           0               0
        7          :           0               0
        8          :           0               0
        9          :           0               0
       10          :           0               0
       11          :           0               0
       12          :           0               0
 ======================================================
SYS_console> _
```

get-mgm-brcnt

Retrieve the counters for the management interface.

```
SYS_console> get-mgm-brcnt
 Management Port Counters
=========================================
 Frm   Received    :     24140
 Bytes Received    :   2710566
 Frm   Filtered    :     12907
 Frm Received Bcast:     14205
 Frm Transmited    :     29047
 Frm Transmit Ucast:      2487
 Frm Transmit Mcast:     26560
 Frm Transmit Bcast:         9
 Received from port:      FRAMES           BYTES
-------------------------------------------------
        1          :           0               0
        2          :           0               0
        3          :           0               0
        4          :           0               0
        5          :           0               0
        6          :           0               0
        7          :           0               0
        8          :       24140         2710566
        9          :           0               0
       10          :           0               0
       11          :           0               0
       12          :           0               0
 Transmit to port  :      FRAMES           BYTES
-------------------------------------------------
        1          :        3802          228120
        2          :        3802          228120
        3          :        3802          228120
        4          :           0               0
        5          :        3802          228120
        6          :        3802          228120
        7          :        3802          228120
        8          :        6289          425219
        9          :           0               0
       10          :           0               0
       11          :           0               0
       12          :           0               0
-------------------------------------------------
SYS_console> _
```

Console Command Line Reference

Console Commands

?	Lists the console commands.
help-kbd	Lists the console functional keys
banner	Display banner
clear	Clear console screen
login	Exit the Admin Interface but do not disconnect a Telenet session
logout	Exit the Admin Interface and any active Telenet session
set-prompt	Change console prompt
set-passwd	Change the console password

Sysytem Commands

sys-stat	Show system status
get-stst-level	Show self-test level of switch
set-stst-level	
warm-reset	Warm reset of device
cold-reset	Cold reset of device
get-last-err	Displays information about the last fatal error
init-nvram	Initialize NVRAM to default values
get-sw-file	Retrieves SNMP agent software file name
set-sw-file	Sets the SNMP Agent Software file name - for download
get-rsw-file	Retrieves SNMP agent software remote file name
set-rsw-file	Sets the SNMP Agent Software remote file name - for download
get-tftp-srvr	Retrieves IP address of TFTP server for downloading software by agent
set-tftp-srvr	Sets IP address of TFTP server for uploading and downloading
sw-dnld	Begins software download to TFTP server
set-par-file	Sets the SNMP Agent Parameters file name - for automatic setup
set-fg-param	Sets the Ethernet frame generator parameters
start-fg	Starts the Ethernet frame generator
stop-fg	Stop the frame generator

IP Commands

get-ip	Show current IP address
set-ip	Set IP address
get-ip-cfg	Show current IP configuration
set-ip-cfg	Set IP address, netmask and broadcast
clear-ip-cfg	Clear IP configuration in NVRAM
get-gatew	Show default gateway
set-gatew	Define default gateway
get-arp-tbl	Display the ARP Table
add-arp-entry	Adds an entry to the ARP table
del-arp-entry	Deletes an entry/all entries (*) of the ARP table
get-bootp	Retrieves the state of BOOTP process
set-bootp	Enable/disable BOOTP process activation
ping	IP traffic generator
ping-stop	Stop the ping process
get-def-ttl	Retrieves the running default TTL value
set-def-ttl	Modifies the running default TTL value

SNMP Commands

get-comm	Show current read and /or write community
set-comm	Change the read or write community
get-auth	Shows the traps authentication mode
set-auth	Sets the trap authentication mode
get-traps	Show destination stations in the trap list
add-trap	Add destination station to trap list
del-trap	Delete a destination station from trap list

Switching Database Commands

get-sport-hex	Convert list of ports to hexadecimal format for use as sport parameter
get-dport-hex	Convert list of ports to hexadecimal format for use as dport parameter
get-lt-age	Displays the LT aging period
set-lt-age	Modifies the LT aging period
get-lt-entry	Gets an LT entry at index
get-lt-16	Gets 16 LT entries starting at a given index
find-lt-addr	Searches for an address in the LT
del-lt-entry	Removes an LT entry at index
del-lt-addr	Removes an LT with a given address
get-lt-filter	Retrieves Learn Table filter for specified MAC address
add-lt-entry	Adds an LT entry
add-cf-entry	Adds Custom Filter LT entry
del-cf-entry	Deletes Custom Filter entry
get-nv-cftbl	Displays the NVRAM stored Custom Filters table
get-nv-cfilt	Displays the NVRAM stored Custom Filters table for a given MAC address

Virtual LAN Commands

get-con-matrix	Retrieves the VLAN connectivity matrix
get-vbc-matrix	Retrieves the VBC connectivity matrixmonitor
set-vbc-domain	Defines a Virtual Broadcast domain
del-vbc-domain	Deletes a Virtual Broadcast domain
get-vbc-tbl	Displays the Virtual Broadcast domain table
set-sec-vlan	Defines a Security Virtual LAN
del-sec-vlan	Deletes a Security Virtual LAN
get-svlan-tbl	Displays the Security Virtual LAN table
set-isvlan	Establishes a Virtual LAN
del-isvlan	Deletes the Virtual LAN specified by lan_id
get-isvlan	Shows the table of defined Virtual LANs
set-mon-port	Sets monitoring port
monitor	Sets port monitoring
stop-mon	Ends port monitoring
get-nv-mon	Retrieves port monitoring information stored in NVRAM
save-mon	Saves current port monitoring information into NVRAM
clear-nv-mon	Clears port monitoring information previously stored in NVRAM

Spanning Tree Commands

get-stp	Displays the Spanning Tree session state
set-stp	Enables/Disables Spanning Tree - for the next session
get-st-bcfg	Retrieves the Spanning Tree Bridge parameters
get-st-syscfg	Retrieves the Spanning Tree System Ports configuration
get-st-pcfg	Retrieves the Spanning Tree port parameter table
set-st-pcfg	Sets any Spanning Tree port configuration
set-br-prio	Sets the Spanning Tree bridge priority
set-br-maxage	Sets the Spanning Tree bridge MaxAge
set-br-hellot	Sets the Spanning Tree bridge HelloTime
set-br-fwdel	Sets the Spanning Tree bridge Forward Delay
set-prt-prio	Sets the Spanning Tree port priority
set-br-enb	Sets the Spanning Tree port enable/disable
set-br-pcost	Sets the Spanning Tree port path cost

Port Configuration Commands

get-port-cfg	Displays the configuration of all ports
set-port-cfg	Sets any port configuration
set-port-dplex	Sets the port mode: full or half duplex
set-speed-sel	Sets the port speed : 10Mbps, 100Mbps or Asense
set-port-fctrl	Sets the port flow control mode: ON or OFF
set-port-state	Enables or disables a port when Spanning Tree algorithm is not running
set-isvp-mode	Specifies if given port will operate in ISVP trunk mode or ISVP access mode
get-isvp-mode	Retrieves the ISVP mode of the given port number

Switching Statistics Commands

clr-cnt	Clears the switch Ethernet and bridging counters
get-eth-cnt	Gets the Ethernet counters per port
get-colls-cnt	Gets the collision distribution counters per port
get-rmon-cnt	Gets the Ethernet RMON counters per port
get-sdist-cnt	Gets packet size distribution counters per port
get-br-cnt	Gets the switching counters per port
get-mgm-brcnt	Gets the switching counters of the mgmt port

USING AN SNMP MANAGER

This chapter contains instructions regarding the configuration and management of the XM59x with an SNMP Management System (MegaVision).

Configuring the XM59x with an SNMP Agent

The XM59x with an SNMP Agent board installed is a plug and play device. Once connected to the network and powered ON, the XM59x starts operating according to factory-set default values. However, to ensure proper operation and maximum performance specific to your network configuration and to provide SNMP access, some environment-specific parameters must be configured through the Administrative Interface.

Two options exist for managing the XM59x: a) through the GigaHUB ESM; or b) through the XM59x card interface for direct communication with the host.

a) ESM Setup

Open the GigaHUB ESM/LAN Attach window (GigaHUB User's Manual, Part B, Extended System Manager, Section 5.2.4.3) through the following sequence of windows:

Main → **System Config** → **IP Config** → **ESM/LAN Attach**

Select the following attachment mode:

ESM: The XM59x is to communicate through the GigaHUB ESM.

b) Global Setup

1. Connect a terminal to the ESM.
2. Log in to the Administrative Interface.
3. Initialize all the XM59x parameters to their default values. Use the following command sequence:

```
init-nvram
warm-reset
```

4. Wait until you see the LOGIN prompt again. Login to the the Administrative Interface. Now all system parameters have been initialized to their default values.

IP Setup

1. Modify the system IP configuration to match your IP network. Use the **set-ip-conf** command in order to provide an IP address, a netmask and a broadcast address (for more details see Administrative Interface, *IP Commands*). For example:

```
set-ip-conf 129.1.1.64  255.255.255.0  129.1.1.0
```

Check that the actual IP configuration matches the desired one:

```
SYS_console> get-ip-conf
The device IP address, netmask and broadcast are:
       IP address     :      129.001.001.064
       IP netmask     :      255.255.255.000
       IP broadcast   :      129.001.001.000
```

2. Set the default gateway address using the **set-gatew** command. This should be a station that can route IP packets to non-local IP networks. For example:

```
SYS_console> set-gatew 129.1.1.1
```

Confirm that the default gateway IP address was properly accepted:

```
SYS_console> get-gatew
Device default gateway address is : 129.001.001.001
```

SNMP Setup

1. Set up the SNMP communities strings for the two access modes: read and write (see SNMP Commands). Confirm that the read and write communities were properly accepted:

```
SYS_console> set-comm read public
  New read community is: <public>
SYS_console> set-comm write private
  New write community is: <private>
SYS_console> get-comm *
  Current read community is: <public>
  Current write community is: <private>
SYS_console>
```

2. Set up the trap receiver table: add the Network Manager Station(s) that are to receive system generated traps:

```
SYS_console> add-trap 129.1.1.76 public
  Entry 129.1.1.76 - public added
                SNMP TRAP TABLE
                ---------------
                ---------------
        IPADDR                      COMMUNITY
  ____________________________
  129.001.001.065       -------     PUBLIC
  129.001.001.076       -------     PUBLIC
  ____________________________
```

TROUBLESHOOTING

This chapter provides troubleshooting hints for problems you may encounter when trying to manage the XM59x using an SNMP Management System.

- If your SNMP Manager has trouble communicating with the SNMP Agent in the Switch, check your SNMP configuration parameters.

Your Network Administrator can help determine if your IP configuration (IP Address, netmask and broadcast address) is correct. If the SNMP management workstation is on a different network, be sure that you have defined an appropriate Default Gateway IP Address (see 3.3).

- Check the community string configuration by using the **get-comm** * command.

- If you are not receiving any traps, check that you have correctly entered the Network Management Workstation address in the trap receiver table. Display the table using the **get-trap-tbl** command. Check that both the IP Address and the community string are correct.

- If the network management station does not receive authentication failure traps, check for the Authentication Mode using the **get-auth** command.

- Check that you have a correct physical connection to the Switch. Test that the Switch port is configured with the desired Physical Interface: TP or AUI. If you are using the TP interface, check the LINK status.

- Test the connection to the Network Management Station by pinging it. Use the Administrative Interface: ping IPaddress count-number.

- If the network's physical topology has changed recently (e.g. a Network Management Station has been moved from one segment to another), the ARP cache may be out of date. You can use the **del-arp-entry** command to flush the cache.

APPENDIX A: SOFTWARE DOWNLOADING

Requirements

- Diskette with software file to be downloaded.
- DOS station host (management console, VT100 terminal or VT100 terminal emulator) or UNIX host (eg, Sun Sparc)
- TFTP program
- Operational XM59x

Procedure

NOTE *Do not remove card or perform Reset if problems are encountered during the TFTP procedure. Wait for the end of the time-out and restart the TFTP procedure. If this option fails, call NBase Technical Support.*

1. Insure that an IP Address is assigned according to the selected attachment mode, ie:

   ESM: IP Address for GigaHUB ESM
   LAN: IP Address for XM59x

2. Insure that the host and XM59x are interconnected according to the selected attachment mode, ie:

   ESM: Inband GigaHUB's RJ-45 connector attached to a LAN accessible by the host.
   Outband GigaHUB's SLIP/RS-232 DB9 connector attached to the host.
   LAN: XM59x attached to a LAN accessible by the host.

3. Insert the diskette with the software file into the host drive.

4. Select/Create a directory into which to copy the software file, and enter this directory.

5. Copy the software file into a file with the name according to the selected attachment mode, ie:
   ESM: **FLASH12.Sxx** (where **S** must be upper case, and xx are two digits designating the number of the slot housing the XM59x).
   Example: If the slot # is 3, then the file name must be FLASH12.S03
   LAN: Flash12.hex (where **hex** must be lower case)

6. Perform TFTP as follows:

- Select the total timeout for the TFTP transfer retries to be 100 seconds, if possible (not necessary for PCs)
- Select binary transfer mode if the code is in ASCII (equivalent to octet in UNIX code)
- Using the TFTP protocol, send the file (to be loaded into Flash memory) to the IP address of the:
    - XM59x, if downloading is to be executed via the LAN, or
    - GigaHUB, if downloading is to be executed via the GigaHUB ESM

When the file transfer is completed, the XM59x automatically resets itself and reboots with the downloaded software in about two minutes.

Verify that the software has been downloaded by opening the GigaHUB Card Versions window through the following sequence of windows:

Main → System Config → Cards Config → Card Versions

NOTE *If the downloading is to be repeated for a new slot, insure that the file name includes the new slot number (Step 5 above).*

On a UNIX system, for example, the TFTP session would look as follows:

% tftp <*GigaHUB IP Address*>	(ie, start a tftp session for GigaHUB)	where **%** is the host operating system prompt
> mode octet	(ie, send as binary file)	where > is a TFTP prompt
> trace	(ie, display trace output to user)	
> timeout 100	(ie, timeout interval set to 100 seconds)	
> put <*software file name*>	(ie, send software file to to XM59x/GigaHUB)	

where the bold italicized alphanumerics are typed in by the user.

APPENDIX B: SYSTEM DEFAULT VALUES

console

password	NONE
prompt	SYS_console>

system

SW file name	flash12.hex
Parameter file name	param12.hex

ip

BOOTP:	disable
TTL:	10 in range 1..255

snmp

Read Community	public
Write Community	private
Authentication Mode	enable
Traps Managers	NONE

switch-db

Aging Time	300 seconds

port configuration

port duplex	HALF
port select	AUTO
port flow control	ON

spanning tree

Spanning Tree	enable	
Bridge priority	32768	0-65535
Bridge Max Age	20	6.0 - 40.0 sec
Bridge Hello Time	2	1.0 - 10.0 sec
Bridge Forward Delay	15	4.0 - 30.0
Port Priority	128	0-255
Port Cost	1000/LAN speed (Mbps)	